

FINAL

Preliminary Assessment/Site Investigation

Volume I of II Text and Figures

Marine Corps Base Camp Lejeune Jacksonville, North Carolina



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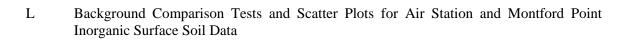
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LIST OF ACRONYMS AND ABBREVIATIONS

AST Above Ground Storage Tank AWQC Ambient Water Quality Criteria

Baker Baker Environmental, Inc.
BEHP bis(2-ethylhexyl)phthalate
bgs Below Ground Surface
BTV Background Threshold Value

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act

CLEAN Comprehensive Long-Term Environmental Action Navy

CLP Contract Laboratory Protocol
CS Characterization Study
CTO Contract Task Order

1,2-DCE 1,2-Dichloroethene

DEM Division of Environmental Management

DoN Department of the Navy

DRMO Defense Reutilization and Marketing Office

EMD Environmental Management Division

EPIC Environmental Photographic Interpretation Center

ESE Environmental Science and Engineering

FFA Federal Facilities Agreement

FMF Fleet Marine Force FS Feasibility Study ft/ft feet per foot ft/day feet per day

ft²/day square feet per day

gal/day/ft gallons per day per foot

gpd gallons per day gpm gallons per minute

HPIA Hadnot Point Industrial Area HPFF Hadnot Point Fuel Farm HQW High Quality Waters

IAS Initial Assessment Study

IMAC Interim Maximum Allowable Concentration

IRA Interim Remedial Action IR Installation Restoration

LANTDIV Atlantic Division Naval Facilities Engineering Command

LTM Long Term Monitoring

LUCIP Land Use Control Implementation Plan

MCAS Marine Corps Air Station MCB Marine Corps Base

MCL Maximum Contaminant Level

LIST OF ACRONYMS AND ABBREVIATIONS

(Continued)

MCLG Maximum Contaminant Level Goal

MEK methyl ethyl ketone
mg/kg milligrams per kilogram
mg/L milligrams per liter
msl mean sea level

NA Natural Attenuation

NAE Natural Attenuation Evaluation

NAVFAC Naval Facilities Engineering Command

NC DENR North Carolina Department of Environment and Natural Resources

NCWQS North Carolina Water Quality Standards

NPL National Priorities List

NREA Natural Resources and Environmental Affairs

NSW Nutrient Sensitive Waters NWI National Wetland Inventory

OU Operable Unit

PA Preliminary Assessment PCB Polychlorinated Biphenyl POL Petroleum-Oil-Lubricants

ppb Parts Per Billion PVC Polyvinyl chloride

RCRA Resource Conservation and Recovery Act

RI Remedial Investigation ROD Record of Decision

SA Esturaine Waters

SC Secondary Recreation Waters
SCS Soil Conservation Service
SDWA Safe Drinking Water Act

SFSA Steel Foundries Society of America

SI Site Investigation SMP Site Management Plan

SVOC Semi-Volatile Organic Compounds SWMU Site Waste Management Unit

TAL Target Analyte List
TCE Trichloroethene
TCL Target Compound List

TCLP Toxicity Characteristics Leaching Procedure

TS Treatability Study

μg/kg micrograms per kilogram μg/L micrograms per liter

USCS Unified Soil Classification System

USEPA United States Environmental Protection Agency

USGS United States Geological Survey
USMC United States Marine Corps
UST Underground Storage Tank

LIST OF ACRONYMS AND ABBREVIATIONS (Continued)

VOC	Volatile Organic	Compound

WAR Water and Air Research WRS Wilcoxon Rank Sum

EXECUTIVE SUMMARY

INTRODUCTION

This project was performed under the direction of the Atlantic Division Naval Facilities Engineering Command (NAVFAC, formerly known as LANTDIV). The final report presents the Preliminary Assessment (PA) completed for twelve areas/buildings and Site Investigation (SI) for seven of the twelve areas located within the Marine Corps Base (MCB), Camp Lejeune. MCB, Camp Lejeune is located on the coastal plain of North Carolina in Onslow County and is a training base for the United States Marine Corps. The work was performed under the Comprehensive Long-Term Environmental Action Navy (CLEAN) II Program, Contract Task Order Number 0190 (CTO - 0190) for LANTDIV.

This PA and initial SI activities follow Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) guidelines. It focuses on potential risks posed by possible uncontrolled releases of hazardous substances, pollutants, or contaminants into the environment that may have occurred at sites or facilities which used or created hazardous materials. The criteria and priorities are based upon relative risk or danger to public health, welfare, or the environment, taking into account the population at risk, the types of hazardous substances at such facilities, the potential for contamination of drinking water supplies, the potential for direct human contact, and the potential for destruction of sensitive ecosystems.

Discovery and initiation of the PA Sites was performed by the Base, in keeping with their efforts of a proactive approach to the investigation of environmental contamination. Initially, 20 sites were discovered through the "Plants Account Facilities Inventory Listing of Buildings and Structures, June 30 1990, MCB, Camp Lejeune, North Carolina" based on their listed identifications of operations. These 20 sites were listed as six laundry/dry cleaning facilities, an eight-vehicle maintenance shop, five automotive hobby shops, and one furniture repair shop. The buildings were chosen because other buildings where similar operations occurred were previously investigated and found to have resulted in releases of contamination into the environment. After preliminary investigation into the 20 sites, sufficient information was gathered to preliminarily remove eight sites from further investigation through the PA process as describe in the letter from the Environmental Management Division (EMD) of Camp Lejeune to the United States Environmental Protection Agency (USEPA) and the North Carolina Department of Environment and Natural Resources (NC DENR) (Appendix D). The eight Sites are buildings HP438, HP1500,

HP1502, AS118, BB16, BB71, M602, and TT2467. Once approval was granted from the USEPA and NC DENR to remove the eight sites, the PA proceeded to investigate the remaining twelve sites of concern.

The purpose of the PA process is to identify areas (or sites) which may have used, stored or handled potentially hazardous materials, and to determine the potential risk to human health and the environment from previous site activities. Sites that require additional investigation at the conclusion of the PA will be recommended for further activities including a SI.

SITE DESCRIPTION, OPERATIONAL HISTORY AND WASTE CHARACTERISTICS

The following PA Sites were researched within this report by performing an Environmental Literature Review (Dolph, October 2001), field reconnaissance, Underground Storage Tank (UST) Section of Camp Lejeune information search, and Installation Restoration (IR) program information search:

Hadnot Point

HP902, HP908, HP1120, HP1124, HP1409, HP1512;

Air Station

TC830, SAS113, AS116, AS119; and,

Montford Point

M119 and SM173.

The site description, operational history, waste characteristics and estimated waste quantity were described for each site of concern. Waste characteristic descriptions are mainly based on the findings of the historical reviews, and the knowledge of typical wastes generated by the processes that took place in the buildings, keeping in mind that what are now typical waste handling procedures and regulations were not developed when the Base generated most of the waste materials. Based on descriptions of documented operations at the Base, the typical hazardous wastes generated may have included; vehicle repair related wastes including waste oils, solvents such as carbon tetrachloride, trichloroethene (TCE), mineral spirits, toluene, and acetone for cleaning; solvents and metals, including lead, chromium, cadmium, and arsenic used in paint-

spraying; and other substances, such as gun preservation materials. Other sources of potential

concern include petroleum products housed in storage tanks above and below ground.

PATHWAY AND ENVIRONMENTAL HAZARD ASSESSMENT

The sites included within this report were evaluated for potential migration and exposure

pathways with regard to possible receptors. Specifically, each site was evaluated for:

groundwater migration pathways, surface water migration pathways, soil exposure pathways, and

air migration pathways.

SUMMARY OF FINDINGS

Of the twelve sites investigated, five sites were determined to be included in ongoing

investigations which are being conducted in and around their immediate vicinity under various

remedial investigation programs. The seven remaining sites had no known remedial

investigations performed and presented insufficient evidence for concluding that they present no

potential environmental and/or human risk.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the Preliminary Assessment, the following seven sites are recommended

for additional investigation:

HPIA Sites:

Building HP1120

Building HP1409

Building HP1512

Air Station Sites:

Building SAS113

Building AS116

Building AS119

Monford Point Site:

Building M119

ES-3

The five following sites are recommended for no additional action:

HPIA Sites:

Building HP902

Building HP908

Building HP1124

Air Station Site:

Building TC830

Montford Point Site:

Building SM173

PA SITES FIELD INVESTIGATION

Based on the conclusions and recommendations of this PA Report, it was decided by the Camp Lejeune Partnering Team in April 2002 to further investigate the HPIA PA Sites (Buildings HP1120, HP1409, and HP1512) during a field investigation at Site 78 that was performed in June 2002. Likewise, the Partnering Team decided at the April 2004 meeting to further investigate the Air Station and Montford Point PA Sites (SAS113, AS116, AS119, M119, and M315). Building M315 was added as a site to be investigated since it was thought that the facility operated as a dry cleaner. No records were found to indicate dry cleaner operations; however, the building was used as a laundry pick-up facility until around the 1980s. It was also decided to document the findings of the PA Sites investigation within this PA/SI Report. The objectives of the Partnering Team were followed throughout the investigation, including locations for sampling and laboratory analytical parameters.

The PA Sites field investigation activities consisted of a soil and groundwater investigation. The focus of the investigation was in the soil and groundwater immediately adjacent to Buildings 1120, 1409 and 1512 within the HPIA; Buildings SAS113, AS116, and AS119 within the Air Station; and Buildings M119 and M315 within Montford Point. Field activities were conducted over two field events. The HPIA field event took place from July 1 to 2, 2002, while the Air Station and Montford Point field activities took place June 7 to 11, 2004.

Surface and subsurface soil analytical data was screened using the North Carolina soil-to-groundwater concentrations (Section 6.3.4) to assess which contaminants require further consideration. Inorganic compounds are further screened using base background data. Inorganic

compound concentrations exceeding both North Carolina soil-to-groundwater concentrations and base background would require further consideration. For the Air Station and Montford Point PA Sites, two background comparison tests were run for the inorganic surface soil data. In cases where both tests indicated that a compound exceeded background data, the compound was identified for further consideration.

Groundwater organic analytical data is screened using the NCWQS and USEPA Region IV MCLs for positive detections of VOCs in groundwater. Groundwater inorganic analytical data is screened using the NCWQS and base background groundwater data. Groundwater inorganic compound concentrations exceeding both NCWQS and base background would require further consideration.

In summary and as determined during the October 2002 Partnering Meeting, Buildings 1120, 1409 and 1512 require no further investigation. There is no evidence from the data to suggests that these areas have been impacted from past site operations. Buildings SAS113, AS116, AS119, M119, and M315 require additional groundwater investigation for inorganics. It is recommended to install one monitoring well in the location of the highest screening results and to sample using low-flow methods at each site. Buildings AS119 and M315 require further investigation of soil.

1.0 INTRODUCTION

This Preliminary Assessment (PA)/Site Investigation (SI) Report of twelve sites of concern at Marine Corps Base (MCB) Camp Lejeune, North Carolina was prepared under direction of the Atlantic Division Naval Facilities Engineering Command (LANTDIV). The work is being performed under the Comprehensive Long-Term Environmental Action Navy (CLEAN) II Program, Contract Task Order Number 0190 (CTO - 0190) for LANTDIV.

MCB, Camp Lejeune was placed on the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) National Priorities List (NPL) effective November 4, 1989 (54 Federal Register 41015, October 4, 1989). Subsequent to this listing, the United States Environmental Protection Agency (USEPA) Region IV; the North Carolina Department of Environment and Natural Resources (NC DENR); the Department of the Navy (DoN); and the Marine Corps entered into a Federal Facilities Agreement (FFA) on March 1, 1991 (effective date) for MCB, Camp Lejeune. The primary purpose of the FFA was to ensure that environmental impacts associated with past and present activities at the Base were thoroughly investigated, and that appropriate CERCLA response and Resource Conservation and Recovery Act (RCRA) corrective action alternatives were developed and implemented as necessary to protect the public health and welfare, and the environment (MCB, Camp Lejeune FFA, 1989).

1.1 MCB, Camp Lejeune Location and History

This section summarizes information concerning the general location and history of MCB, Camp Lejeune. More detailed information is provided in future sections of this report as appropriate. The tables and Figures for Section 1.0 are presented at the end of the section.

Located in Onslow County, North Carolina, MCB, Camp Lejeune is a training base for the United States Marine Corps (USMC). The facility is bisected by the New River and encompasses approximately 236 square miles, of which approximately 40 square miles is water (New River and its tributaries). The New River flows in a southeasterly direction and forms a large estuary before entering the Atlantic Ocean. The southeastern border of MCB, Camp Lejeune is the Atlantic Ocean shoreline. The western and northeastern boundaries of the facility are U.S. Route 17 and State Route 24, respectively. The City of Jacksonville borders the facility to the North. Figure 1-1 provides a map of the Base.

Construction of MCB, Camp Lejeune began in April 1941 at the Hadnot Point Industrial Area (HPIA), where major functions of the Base are centered today. The facility was designed to be the "World's Most Complete Amphibious Training Base". The MCB, Camp Lejeune complex consists of six geographical and operational locations under the jurisdiction of the Base Command. These areas include Camp Geiger, Montford Point (which includes Camp Johnson), Courthouse Bay, Mainside, the Rifle Range Area, and the Greater Sandy Run Area. Marine Corps Air Station (MCAS) New River is operationally under the control of MCAS Cherry Point. However, MCB, Camp Lejeune is responsible for the facilities and environmental management of MCAS New River.

The MCAS New River, which is a tenant organization, encompasses 2,772 acres and is located in the northwestern section of the complex and lies approximately five miles south of Jacksonville. The MCAS includes air support activities, troop housing and personnel support facilities, all of which immediately surround the aircraft operations and maintenance areas.

1.2 Purpose of the Preliminary Assessment and Site Investigation

The purpose of the PA process is to identify areas (or sites) which may have used, stored or handled potentially hazardous materials, and to determine the potential risk to human health and the environment from previous site activities. Sites that require additional investigation at the conclusion of the PA would generally be recommended for further activities including a Site Investigation (SI). The CERCLA defined PA and SI processes are illustrated in Appendix A (DoN, 2001).

The purpose of the PA Report is to present information and data obtained during the PA Environmental Literature Review (Dolph, October 2001), and the field reconnaissance (Appendix I). Based on these findings, information from previous investigations at the sites, and qualitative evaluations of the migration of contamination, recommendations are presented regarding the need, if any, for future activities at the site. The following documentation types were sought and reviewed when preparing the Environmental Literature Review (Dolph, October 2001):

- Station (Activity) maps
- Building and structure plans

- Property record cards
- Contracts
- Environmental reports
- Annual command chronologies
- Oil and hazardous materials spills contingency plans
- Photographs
- Master shore stations development plans
- World War II administrative histories
- Command chronologies
- General activity histories
- Above Ground Storage Tank/Underground Storage Tank (AST/UST) documentation

Research for the Environmental Literature Review (Dolph, October 2001) was also performed at the following repositories:

- Naval Archives I, Pennsylvania Avenue, Washington, D.C.
- National Archives II, Adelphi Road, College Park, MD
- Operational Archives, Naval Historical Center, Washington Navy Yard, Washington, D.C.
- Washington National Records Center, 4205 Suitland Road, Suitland, MD
- Aviation History, Naval Historical Center, Washington Navy Yard, Washington, D.C.
- Navy Library, Naval Historical Center, Washington Navy Yard, Washington, D.C.
- Photographic Section, Naval Historical Center, Washington Navy Yard, Washington,
 D.C.
- USMC Research Center, USMC University, Marine Corps Base, Quantico, VA
- Archives, USMC Historical Center, Washington Navy Yard, Washington, D.C.
- Library, USMC Historical Center, Washington Navy Yard, Washington, D.C.
- Naval Facilities Engineering Command, Service Center & Seabee Museum (Old NAVFAC Archives), Port Hueneme, CA
- MCB, Camp Lejeune, Jacksonville, NC
 - Environmental & Safety Office
 - Resident Officer in Charge of Construction
 - Library
 - Public Works

- Fuels Department
- Public Affairs Office
- Photographic Laboratory
- Cultural Resource Office
- MCAS. New River, Jacksonville, NC
 - Environmental & Safety Office
 - Resident Officer in Charge of Construction
 - Library
 - Public Works
 - Fuels Department
 - Public Affairs Office
 - Photographic Laboratory

These sources of information were used to evaluate the past and current sites conditions. In addition to the above sources of information, Installation Restoration (IR) program reports were referenced as appropriate for areas of the Base previously studied under the IR program. The UST Section of Camp Lejeune was also contacted to obtain information on any UST Sites in the areas of the PA Sites being investigated. Areas that are being studied under UST Program were excluded from this report, due to the CERCLA exclusion of sites that potentially contain crude oil, fractions of crude oil, or refined crude oil products. Appendix C provides information from UST Program areas that are nearby the PA Sites. The locations of all PA Sites were also visited to evaluate the present site conditions.

The following documents were used to conduct and guide the PA process of identifying sites of concern:

- "Guidance for Performing Preliminary Assessments under CERCLA", EPA/540/G-91/013, September 1991; and
- "Navy/Marine Corps IR Manual", March 2000.

Following the guidance of the above documents, all data was compiled and qualitatively reviewed by assessing hazardous substance exposure routes called pathways. Three pathways refer to migration (groundwater, surface water, and air) and one pathway pertains to exposure(soil exposure). Each pathway represents a means by which hazardous substances may impact human

health and/or the environment. Each of these pathways qualitatively reviewed the following three categories:

- Likelihood of Release The relative likelihood of a hazardous substance migrating from the site through the specific pathway medium (soil, groundwater, surface water and air).
- Targets The presence of people, physical resources (drinking water wells or surface water intakes), and environmental resources (sensitive environments, fisheries) that might be threatened by release of a hazardous substance from the site.
- Waste Characteristics An estimation of the type and quantity of hazardous wastes at the site.

These were qualitatively evaluated during the PA process by applying "professional judgment" and providing explanations for the appropriate hypothesis throughout the report. Critical PA professional judgments take the form of hypotheses that (1) a release of a hazardous substance is or is not suspected to have occurred; and (2) specific targets are or are not suspected to have a relatively high likelihood of exposure to released substances (USEPA, September 1991).

1.3 <u>History of the PA Sites</u>

Discovery and initiation of the PA Sites was performed by the Base, in keeping with their efforts of a proactive approach to the investigation of environmental contamination. MCB Camp Lejeune is on the NPL, and with the signing of the FFA that specifies requirements for the remediation of IR sites, the Base had identified 20 additional sites of potential concern. The 20 sites discovered are listed in the "Plants Account Facilities Inventory Listing of Buildings and Structures, June 30 1990, MCB, Camp Lejeune, North Carolina" as six laundry/dry cleaning facilities, an eight-vehicle maintenance shop, five automotive hobby shops, and one furniture repair shop. The reason these 20 facilities were chosen for PA investigation was based on other buildings where similar operations occurred were previously investigated and found to have resulted in releases of contamination into the environment. The PA process would discover any potential historical contamination and investigate it properly through the CERCLA process of discovery and investigation as illustrated in Appendix A.

The first step through the PA process was to conduct an Environmental Literature Review that would provide historical information for the 20 sites of potential concern, as prepared by the Navy Historian (Dolph, October 2001). The Environmental Literature Review Report along with

additional information gathered from the UST Section at Camp Lejeune and IR Site information provided sufficient detail to preliminary remove eight sites that would not require further investigation throughout the PA process. The eight Sites are Buildings HP438, HP1500, HP1502, AS118, BB16, BB71, M602, and TT2467 as illustrated on Figure 1-1. [The "HP" prefix designates those buildings that are located within the Hadnot Point area to prevent confusion with other buildings reviewed on the Base; the building number used by the Base does not include the "HP" prefix. The "HP" prefix is used throughout this report to help identify the area and building under review.] The rational for the removal of these eight sites are presented in Table 1-1. To remove the eight sites from further investigation, the Environmental Management Division (EMD) of Camp Lejeune prepared a letter in January 2002 to the USEPA stating the reasons for removal. A copy of this letter is included in Appendix D. Once the USEPA and the NC DENR granted approval to remove the eight sites, the PA proceeded to investigate the remaining twelve sites of concern.

The next step in the PA process is a field reconnaissance to visually assess the current environmental status of the sites. The EMD of Camp Lejeune would provide the necessary field reconnaissance for compilation into the PA Report. Baker provided EMD with PA Field Inspection Checklists for the field reconnaissance to verify all conditions at the sites, with existing information answered. The checklists were used as directed by the "Guidance for Performing Preliminary Assessments Under CERCLA" (USEPA, September 1991). The completed PA Field Inspection Checklists are provided in Appendix I.

The final step in the PA process is compiling and assessing all information gathered about the sites throughout the preparation of the PA Report. The PA Report will determine if additional investigations are warranted through the SI process (Appendix A).

1.4 Previous Investigations

Presented below are summaries of previous investigations performed at the Base. Investigative activities at the Base began in 1983 with an Initial Assessment Study (IAS) conducted by Water and Air Research (WAR, April 1983). Sites requiring further investigation were advanced to additional studies and characterization, and were presented in the Site Summary Report (ESE, 1990). Currently, the fiscal year 2002 Site Management Plan (SMP) for MCB, Camp Lejeune, a primary document referenced in the FFA, identifies 42 sites that require Remedial Investigation/Feasibility Study (RI/FS) activities. These 42 sites have been divided into 21

Operable Units (OUs). Operable units are formed as an incremental step toward addressing individual site concerns and to simplify the specific problems associated with a site or group of sites.

The UST Section of the Base has also been involved with all areas where UST contamination is present as noted below for each area of the Base.

1.4.1 Hadnot Point Industrial Area

The HPIA consists of IR Sites 21, 24, 78, and 94 and collectively compromise OUs 1 and 18. Numerous investigations have been performed at these OUs since the IAS, and are currently being performed under the IR and UST programs. The HPIA PA Sites that are being investigated for this report are within OU No. 1. The PA Sites are associated with the following buildings as illustrated on Figure 1-1: HP902, HP908, HP1120, HP1124, HP1409 and HP1512. These buildings have not been investigated under the following studies, however, previous investigations at Site 78 surrounding the PA Sites will provide valuable information for this PA Report. The following sections describe the previous investigations at Site 78 and its' present environmental status.

A two-part Confirmation Study was conducted by Environmental Science and Engineering, Inc. (ESE) from 1984 through 1986 (ESE, September 1990). The purpose of the Confirmation Study was to investigate potential contaminant source areas identified in the IAS Report. Site 78 was evaluated and consequently was determined to warrant further investigation. Supplemental Characterization Steps were performed by ESE from 1990 through 1991, and in 1991 a Characterization Study (CS) / RI was performed for the shallow soils and the Castle Hayne (deep) aquifer. A Final Interim Remedial Action (IRA) Record of Decision (ROD) was prepared for the surficial aquifer in 1992 by Baker Environmental, Inc. (Baker). A RI/FS was prepared by Baker from 1993 through 1994. The Final ROD for OU No. 1 was prepared by Baker in 1994 and stipulated remedial objectives for Site 78 including a pump and treat system and a Long Term Monitoring (LTM) program for groundwater. Pump and treat operations (North Plant only) and LTM have been ongoing at this site and continue today. Preliminary Natural Attenuation (NA) studies have been completed and Treatability Studies (TS) are planned for the groundwater at Site 78 in 2002 and 2003. The Northern Pump and Treat System is in operation near PA Site HP902.

There are a number of Site Waste Management Units (SWMUs) being investigated within OU No. 1 under the RCRA program, two of which (SWMUs 292 and 293) are in close proximity to PA Site HP1124 as illustrated on Figure 1-1.

There are also a number of UST Sites that are being investigated within the HPIA that are in close proximity to PA Sites HP902, HP1409 and HP1512 as presented in Appendix C.

1.4.2 Air Station

Numerous investigations have been performed on the air station portion of the Base, including Camp Geiger. The air station and Camp Geiger areas of the Base have been studied under the IR program including IR Sites 35, 36, 43, 44, 48, 54, 75, 76, 86, 87, 89 and 93. The PA Sites located on the air station portion of the Base consist of the following buildings/areas as illustrated on Figure 1-1: TC830, SAS113, AS116 and AS119. These buildings have not been investigated under the IR program, however, there are IR Sites in close proximity to the PA Sites including IR Sites 75, 76, 86, 89 and 93.

There are a number of SWMUs that are being investigated at the air station, one of which (SWMU 299) is in close proximity to PA Site AS116 as presented on Figure 1-1.

There are also a number of UST Sites that are being investigated at the air station, that are in close proximity to PA Sites SAS113, AS116, and AS119 as presented in Appendix C.

1.4.3 Montford Point

Investigations have been performed on the Montford Point area of the Base, including IR Sites 7, 16, and 85. The PA Sites located on the Montford Point area of the Base consist of the following buildings/areas as illustrated on Figure 1-1: M119 and SM173. These buildings have not been investigated under the IR program, however, SWMU 314 may be located in the same area as SM173. There is also one UST site that is located at Building M-90 in this area of Montford Point.

1.5 Report Organization

This PA/SI Report is divided into six sections, including:

- Section 1.0 Introduction
- Section 2.0 Site Description, Operational History and Waste Characteristics
- Section 3.0 Pathway and Environmental Hazard Assessment
- Section 4.0 Summary of Findings
- Section 5.0 Conclusions and Recommendations
- Section 6.0 PA Sites Field Investigation
- Section 7.0 References

Tables and figures are located after the text portion of the above sections. Supporting information is contained within the appendices referenced throughout the document, which include Appendices A through L. All of these appendices are included in Volume II of the PA report.



TABLE 1 - 1 PRELIMINARY INVESTIGATION SITES REMOVED FROM FURTHER INVESTIGATION, 20 SITES LIST PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB CAMP LEJEUNE, NORTH CAROLINA

Site	Rational for Removal	
HP438	Noted as a "Dry Cleaning Plant" but only laundry operations were performed here, not dry cleaning operations.	
ПГ436	Also, no known hazardous substances were used or stored here.	
HP1502	This building is already being studied under the UST and SWMU Programs.	
N4600	Noted as a "laundry" no dry cleaning operations were performed here. Also, no known hazardous substances	
M602	were used or stored here.	
DD16	Noted as a "Clean & Press Shop and Laundromat" but only laundry operations were performed here, not dry	
BB16	cleaning operations. Also, no known hazardous substances were used or stored here.	
BB71	This building is already being studied under the UST Program.	
TT2467	This building is already being studied under the UST Program.	
AS118	This building is already being studied under the UST and SWMU Programs.	
	Noted as a "laundry" no dry cleaning operations were performed here. Also, no known hazardous substances	
HD1500	were used or stored here. There are two wells that border the building (78-GW07 and 78-GW08 which are	
HP1500	included in the regular monitoring program), and both wells have had consistent non-detections. Data is in the	
	LTM Reports for Site 78 (Baker, 1997-2001).	

Notes:

(1) Criteria for removing a site from the original list of the 20 Sites included the following informational sources:

Dolph, E. Jim. October 25, 2001. <u>Twenty Potential Sites Environmental Literature Search, MCB, Camp Lejeune, North Carolina.</u> Prepared for the Department of the Navy, Naval Facilities Engineering Command - Atlantic Division, Norfolk, Virginia.

Baker 2001. <u>Site Waste Management Unit Investigations, MCB, Camp Lejeune, North Carolina</u>. Prepared for the Department of the Navy, Naval Facilities Engineering Command - Atlantic Division, Norfolk, Virginia.

Lowder, Bob. 2001. <u>Underground Storage Tank Program Status</u>, Twenty New Sites of <u>Potential Concern CTO-190</u>, MCB, Camp Lejeune, North Carolina.

Baker 1997-2001. Long Term Monitoring Report, OU No. 1 (Site 78), MCB, Camp Lejeune, North Carolina. Prepared for the Department of the Navy, Naval Facilities Engineering Command - Atlantic Division, Norfolk, Virginia.

(2) According to the 1982 Draft and 1983 Final Initial Assessment Studies, there were numerous laundry distribution centers throughout Camp Lejeune, however, all dry cleaning operations were performed in Builiding 25. This was verified by reviewing the 1976 Naval Environmental Protection Support Service Air Emission Master File Summary. (Dolph, E. Jim, October 2001)



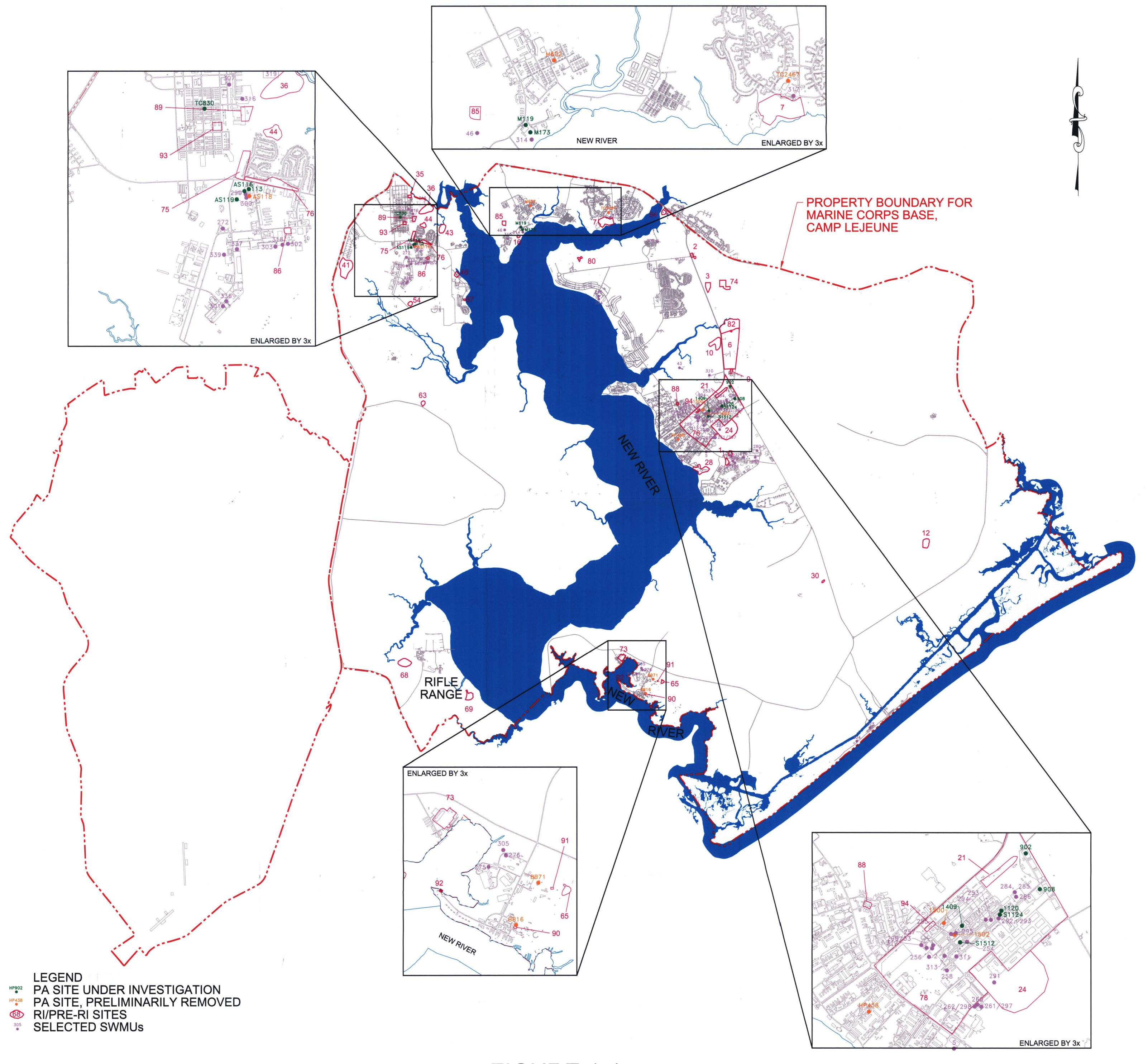


FIGURE 1-1
PA SITE LOCATION MAP
MARINE CORPS BASE, CAMP LEJEUNE
PA SITES, CTO-190



2.0 SITE DESCRIPTION, OPERATIONAL HISTORY AND WASTE CHARACTERISTICS

The following sections include information obtained through the Environmental Literature Review (Dolph, October 2001), field reconnaissance, and other sources of information as referenced throughout. The tables and figures for Section 2.0 are presented at the end of the section.

2.1 Sites of Concern

The following sections describe the specific sites of concern which are presented by areas on the Base (i.e. Hadnot Point, Air Station, Montford Point). The areas of concern are discussed below and are viewed as separate sites within Camp Lejeune. Appendix B contains photographic documentation of the areas of concern and Appendix C contains information on non-CERCLA areas including USTs. Historical drawings of the facilities that document operations at the sites are included in Appendix E. For additional historical drawings refer to the Environmental Literature Review (Dolph, October 2001). Appendix F details previous investigations that were performed on or near the PA Sites and information including findings from previous reports, monitoring well construction details, and analytical data. Appendix H provides information on SWMU investigations that were performed on or near the PA Sites. Appendices are referenced throughout the report as appropriate.

The site description, operational history, waste characteristics, and estimated waste quantities are described for each site of concern. Waste characteristic descriptions are mainly based on knowledge of typical wastes generated by the processes that took place in the buildings, keeping in mind that what are now typical waste handling procedures and regulations were not developed when the Base generated most of the waste materials through manufacturing processes. Based on descriptions of documented operations at the Base, the typical hazardous wastes generated may have included; vehicle repair related wastes including waste oils, solvents such as carbon tetrachloride, trichloroethene (TCE), mineral spirits, toluene, and acetone for cleaning; solvents and metals, including lead, chromium, cadmium, and arsenic used in paint-spraying; and other substances, such as gun preservation materials. Other sources of potential concern include petroleum products housed in storage tanks above and below ground.

Waste quantities were estimated for each site considering a worse case scenario. Because the amount of waste materials that potentially could have migrated into the environment could not be determined, the foundation or footprint of a building or a selected perimeter area was determined for use in qualitatively assessing the areas.

2.2 <u>Hadnot Point Industrial Area Sites</u>

As mentioned previously OU No. 1, Site 78, has been studied extensively through the IR and UST programs. Currently, there is a pump and treat system operating in the northern portion of Site 78 and an LTM program in place for the entire OU as stipulated in the Final ROD for OU No. 1 (Baker, September 1994). The PA Sites within Site 78 are associated with buildings HP902, HP908, HP1120, HP1124, HP1409 and HP1512 as illustrated on Figure 2-1.

The HPIA which houses the industrial area of the mainside portion of MCB Camp Lejeune, is located between Sneads Ferry Road, Holcomb Boulevard, Duncan Street, and Main Service Road. The site covers an area of approximately 590 acres, the majority of which is paved. However, there are many lawn areas associated with individual buildings within the sites, and there are several acres of woods in the southern portion of the site.

The land within Site 78 is relatively flat. The installation of drainage ditches, storm sewers, and extensive paving typically have altered natural drainage. Surface runoff not intercepted by a manmade structure from the southern portions of the site may drain to Codgels Creek (Baker, June 1994). Surface runoff from some areas in the northwestern portions of the site may drain to the Beaver Dam via storm water sewers (Baker, June 1994). Previous investigations show groundwater to generally flow from east to west across Site 78.

The HPIA, constructed in the late 1930s, was the first facility at MCB Camp Lejeune. The area is comprised of maintenance shops, warehouses, painting shops, auto body shops, and other similar facilities. Due to the industrial nature of the area, many spills and leaks have occurred over the years. Most of these spills and leaks have consisted of petroleum-related products and solvents from USTs, drums, and uncontained waste storage areas. Provided on Figure 2-2 are locations of possible source areas within OU No. 1, based on past operations at buildings, locations of USTs and ASTs, and wash rack areas. Presently, there are no known uncontrolled waste disposal activities related to the site.

Historical aerial photographs from 1956, 1964, 1984, and 1996 are illustrated on Figures 2-3, 2-4, 2-5, and 2-6, respectively. An analysis of aerial photography was performed for Site 78 by the Environmental Photographic Interpretation Center (EPIC) (EPIC, 1992). The study covered the period between 1938 and 1990. The analysis included a review of historical aerial photographs and stereoscopic viewing. Stereoscopic viewing creates a perceived three-dimensional effect which, when combined with viewing at various magnifications, enables the analyst to identify spectral or tonal signatures associated with different features and environmental conditions on the ground. The study concluded that possible staining dating back to 1944 was evident near numerous equipment maintenance/wash racks throughout the site at motor pools and maintenance areas. From the 1949 aerial, liquid and/or stains were visible emanating from buildings. The following sections describing the characteristics that were recognized at the HPIA PA Sites as shown by handwritten notes and drawings on the aerial photographs in the EPIC Report for the HPIA. Drawings from the EPIC Report are included in the Site 78 RI as Appendix A (Baker, June 1994).

• 1949

Drawings from EPIC for 1949 in the area of Building HP1512 are noted as having staining and an equipment maintenance/wash rack. Directly south of Buildings HP1120 and HP1124 there is liquid discharged noted near Buildings HP1107 and HP1106.

• <u>1956</u>

Drawings from EPIC for 1956 in the area of Building HP1512 again note staining and an equipment maintenance/wash rack.

• 1964

Drawings from EPIC for 1964 do not indicate any notes by Building HP1512 during this period. Equipment maintenance/wash racks, and staining are noted west of Building HP902.

• 1984

Drawings from EPIC for 1984 show liquid staining directly south of Building HP1409 in the center of the block between Building HP1401 and HP1410. Liquid discharge is also noted at Building HP1124 during this period. Equipment maintenance/wash racks and staining are again noted west of Building HP902.

Currently, there are land use restrictions in place for groundwater and soils within OU No. 1. Except for monitoring purposes, use of groundwater within 1,000 feet of OU No.1 is prohibited (i.e., installation of new water supply wells), as stipulated in the Land Use Control Implementation Plan (LUCIP) for OU No. 1 (Baker, June 2001). Therefore, potential groundwater use will not be evaluated for the HPIA PA Sites.

2.2.1 Building HP902

2.2.1.1 Site Description

Building HP902 is located in the northern most portion of Site 78, bordering Sneads Ferry Road as shown on Figures 1-1 and 2-1. It is a one-story brick building (Appendix B, Photos 1 through 7) with dimensions of 360 ft x 180 ft. Adjacent areas consist of paved and unpaved roads, parking lots, storage areas for heavy equipment, dumpsters and drums, and other buildings.

Monitoring Wells

South of Building HP902 are a number of monitoring wells and a network of recovery wells associated with the Northern Treatment Plant as shown on Figure 2-1. Four monitoring wells are located between Buildings HP902 and HP903 as follows: IR78-GW24-1, IR78-GW24-2, IR78-GW24-3, and IR78-GW44. Recovery well IR78-RW11 is located on the south side of Building HP902.

Aboveground and Underground Storage Tanks

There is one former UST site located south of Building HP902 at Building HP903, with associated monitoring wells (Appendix C, HPIA).

One UST suspected in the area of Building HP902 was found during the Environmental Literature Search; however, no records could be located (Dolph, October 2001) regarding its specific usage. A UST has already been investigated during the CS and supplemental reports for this area, and was determined to have contained TCE and was associated with Building HP903.

An AST and drums were identified inside a fenced storage area during the site visit, as shown in Appendix B, Photo 1. The capacity of the AST is approximately 250 gallons and contains used oil. The drums are approximately 55 gallons each and contain used oil. Other storage containers that were identified include containers of a capacity of 17.55 gallons, containing oil, and were described as being in excellent condition. No evidence of release was identified for any of the storage containers.

2.2.1.2 Operational History

The following sections describe the past and present use at Building HP902, and are also summarized in Table 2-1.

Building HP902 is one of four Ordnance Warehouses constructed in 1948 (blueprints of the building layout are presented in Appendix E, Figure HP902-1). Plans indicate that a Small Arms Shop, including parkerizing facilities had been installed in the building by the early 1950s. Parkerizing is the process by which guns are coated for protection. In addition to parkerizing, blueprints indicate that a bluing tank was also located in the shop.

The Steel Foundries Society of America (SFSA) define parkerizing as a proprietary method of producing a protective phosphate coating on ferrous metals. Parker A treatment involves immersing in a bath of acid manganese phosphate. The Parker D is a modification using acid zinc phosphate with a nitrate ion as an accelerator. Bluing is the formation of a thin film of oxide on polished steel to improve its appearance and protect its surface.

The procedures involved to refinish a firearm were provided by a gun refinishing service as follows (Hot Flash, March 2002):

"The process of refinishing a firearm by bluing and parkerizing usually begins by disassembling the firearm and cleaning the parts to remove any rust, if necessary. The parts are then sanded to remove any pitting and the metal is polished to any type of finish desired. After the parts are chemically cleaned and rinsed, they are usually placed in a hot bluing tank at 290° to 310° F or into a parkerizing tank at 200° F to apply the finish. When the finish has taken to the metal, the parts are removed, rinsed in water, and then put into a neutralizer tank to remove any traces of the bluing salts. The parts are then transferred to a rinse water tank to

remove the neutralizer prior to being placed in a water displacing oil, which displaces any molecules of water left on the metal. Finally, the firearm is reassembled, checked for function and a curing oil is applied."

This process of gun refinishing was most likely performed at Building HP902, where a monorail was constructed to move the weapon parts from one area of the process to another.

It is important to understand the general process of gun refinishing that took place at this building and the chemicals that were potentially used. As outlined on historical blueprints of the building from 1950 (Appendix F, Figures HP902-2 through HP902-3), drainage sumps are noted on the drawings for capturing waste from the parkerizing tanks on the south end of the building, closest to neighboring Building HP903. These drainage sumps may have emptied to a tank or, most likely, to waste water lines that lead southwest through Site 78. There is the possibility that these lines were/are broken or cracked, resulting in potential contamination throughout the area of Building HP902. The waste water lines and the storm sewer lines generally run southeast across the area of the HPIA. The 1948 and 1950 blueprints (Appendix E, Figures HP902-1 through HP902-3) of the floor layout indicate that the following equipment was used in this building:

Small Gun Shop - Parkerizing Facilities

- Paint Spray Booth
- Parkerizing Unit & Five Tanks
- Penetrate Process Tanks
- Drain Tanks
- Vapor Degreaser
- Solvent Drum & Pump
- Sandblast Cleaner
- Air Compressor
- Lead Lined Acid Tank 6' x 3' x 3'
- Water Tank 6' x 3' x 3'
- Monorail

Small Gun Shop

- Bluing Tank
- Riveter
- Grinder
- Lathes
- Skill Saw

By the 1960s a portion of the building was utilized for equipment maintenance. A 1965 plan of the building (Appendix E, Figure HP902-4) indicated that the floor layout included the following areas:

- Storage Areas
- Small Engine Repair
- Welding and Machine Shop Area
- Battery Shop
- Tool Room
- Offices
- Diesel Generator Repair Area

In the mid-1980s an armory was installed in the building. According to a 1986 Environmental Survey conducted by ESE, organics were used to clean the weapons. A blueprint (Appendix E, Figure HP902-5) detailing the armory addition areas depicts:

- Armory Storage
- Warehouse Storage
- Offices

A 1996 historical drawing of the building shows that the armory areas had been replaced with mainly warehouse storage areas and mechanical areas (Appendix E, Figure HP902-6).

A 1998 historical drawing indicates a vehicle maintenance pit was constructed for vehicle repair (Appendix E, HP902-7). The Base currently lists the building as a Construction/Weight Handling Equipment Shop. The most recent site visit indicated that the building provides maintenance for

heavy equipment (graders, backhoes and generators) including painting. The heavy equipment is stored near Building HP902 as shown in Appendix B, Photo 2. Miscellaneous solid waste and debris was also identified near the facility as shown on Photos 1 and 6.

2.2.1.3 Waste Characteristics

The following are known chemicals/compounds that were used or stored in Building HP902 (Dolph, October 2001):

- Wastewater from Vehicle Washing
- Waste Oil
- Safety Kleen Solvent
- Paint Thinner
- Mineral Sprits (Stock Number 8010-00-242-2089)
- Motor Oil (OHD/30 -WT, Stock Number 9150-00-189-6729)
- Motor Oil (OHD/90 -WT, Stock Number 9150-01-035-5394)
- Penetrating Oils
- Parkerizing Chemicals
- Bluing Chemicals

The following are potential chemicals/compounds that were used or stored in Building HP902 (Dolph, October 2001):

• Small Arms Cleaning Chemicals (solvents, organics)

Previous Investigations

As mentioned earlier, numerous environmental investigations were conducted throughout the HPIA. Information detailing previous investigations performed in the area of Building HP902 is included in Appendix F HP902, and are summarized below:

Soil Gas Investigation

Soil gas samples were collected around the perimeter of Building HP902 during the CS investigation due to the suspected UST in this area (ESE, May 1988 and April 1992). The analytical results indicated detections of TCE at 1,497 parts per billion (ppb) in the area of the suspected UST that reportedly contained TCE between Buildings HP902 and HP903. Findings of the soil gas investigation including a figure of sampling points and analytical results are presented in Appendix F.2. It should be noted that soil gas sample locations MW24, MW24-2, and MW24-3 are shown in the incorrect location on the CS report figure included in Appendix F.2. The correct location of these borings are near Building HP903 where the tank and associated monitoring wells (IR78-GW24-1, IR78-GW24-2 and IR78-GW24-3) are located (Figure 2-1).

Soil Borings

- Soil borings were advanced around the perimeter of Building HP902 during the CS investigation (ESE, April 1992). The soils were analyzed for target compound list (TCL) volatile organic compounds (VOCs), pesticides, polychlorinated biphenyls (PCBs), and toxicity characteristic leaching procedure (TCLP) metals. The analytical results indicated only one boring with detections of VOCs, near the area of the suspected UST. The sample contained concentrations of 1,2-dichloroethene (1,2-DCE) (55 milligrams per kilogram [mg/kg] and 120 mg/kg), and TCE (120 mg/kg). No pesticides or PCBs were detected in any of the borings. Inorganics were detected throughout the samples. Select metals (Aluminum, calcium, and iron) were abundant in all samples in concentrations greater than 1,000 mg/kg. Many other metals were also detected, but at concentrations below the certified detection limits. Findings of the soil borings collected during the CS, including a figure of sampling points and analytical results, are included in Appendix F.3.
- Soil borings were also installed during the RI performed by Baker (Baker, June 1994) based on areas of concern identified from previous analytical data, a geophysical investigation, and historical records. The soils were analyzed for TCL VOCs, Semi-Volatile Organic Compounds (SVOCs), pesticides and PCBs. PCBs were not detected in any samples, while VOCs, SVOCs, and pesticides were detected. One VOC was detected at low concentrations (16 micrograms per kilogram [ug/kg] or less) in only the subsurface soils, while SVOCs were detected more greatly in the surface soils including

the following detection ranges: naphthalene 81 J to 1,400 ug/kg; phenanthrene 770 to 9,000 ug/kg; fluoranthene 2,100 to 8,000 ug/kg; and pyrene 1,500 to 7,600 ug/kg. Pesticides were also only detected at low concentrations in the surface samples, probably as the result of spraying activities instead of direct disposal. The overall pesticide concentrations ranged from 5.4 J ug/kg to 37 J ug/kg. Findings of the soil borings collected during the RI, including a figure of sampling points and analytical results, are included in Appendix F.4.

Monitoring Well Installation and Sampling

Monitoring well HPGW24 (also referred to as IR78-GW24-1) was installed and sampled in the area of the suspected UST during the CS investigation (ESE, April 1992). The well was sampled three times, and compounds detected include oil and grease (100 micrograms per liter [ug/L]), benzene (2 ug/L), dichloroethane (12 ug/L), 1,2-DCE (4,000 to 6,400 ug/L), TCE (57 ug/L), and chloride (190 to 250 ug/L). These detected analytes are consistent with the use of TCE and the maintenance of equipment documented to have occurred in this area. Findings from the CS investigation, including well construction records and analytical results, are presented in Appendix F.5.

Other investigations have also analyzed the monitoring wells in the area of Buildings HP902 and HP903. These investigations include the following:

- Site 78 RI performed for groundwater
- LTM at OU No. 1
- Site 78 North Natural Attenuation Evaluation (NAE)

Geophysical Survey

• In June 1992, a geophysical survey was conducted for the Pre-Investigation Study for the RI/FS to investigate several suspected UST areas, one being in the area between Buildings HP902 and HP903. A potential UST, suspected of being the former TCE tank, was identified near Building HP903 from the geophysical findings. Findings of the geophysical investigation, including geophysical figures, are presented in Appendix F.6.

Remedial Actions

Currently, there are a number of monitoring wells and recovery wells in the area of Building HP902 to monitor contamination and recover the contamination through the pump and treat system as stipulated in the ROD for OU No. 1 (Baker, September 1994). Monitoring wells IR78-GW24-1, IR78-GW24-2, IR78-GW24-3, and IR78-GW44 are located south of Building HP902 where the UST was determined to be located and contamination is present. These monitoring wells are regularly sampled through the LTM program at Site 78. Recovery well IR78-RW11 located south of Building HP902 is also sampled regularly through the LTM program at Site 78. Information including analytical data, static water level elevations, and well construction details for the above mentioned monitoring wells and recovery well is included in Appendix F.1, HPIA. It should be noted that a new remedial action plan is in process to replace the pump and treat system with another technology to address the VOC plume near Building HP902. The new treatment technology will be implemented through a treatability study anticipated to start in Fiscal Year 2003.

2.2.1.4 Waste Quantity

Known disposal practices with estimated waste quantities are listed on Table 2-2. As shown, all records indicate that waste from Building HP902 was taken to an AST, or to the Defense Reutilization and Marketing Office (DRMO) except for some waste water from vehicles that was discharged onto the ground, or from oils that were sprayed on unimproved roads all over the Base. This list may not include all wastes that were generated at this facility. There are no records of waste disposal before 1971 when gun refinishing processes were used in this building. Some chemicals that may have been used in the process of gun refinishing at Building HP902 are included in Appendix G.

2.2.2 Building HP908

2.2.2.1 <u>Site Description</u>

Building HP908 is located in the northeastern portion of Site 78, near Michael Road and Sneads Ferry Road as shown on Figures 1-1 and 2-1. It is a one story corrugated iron - prefabricated steel building (Appendix B, Photos 8 through 12) with dimensions of 100 ft x 40 ft. Adjacent areas consist of pavement, concrete, some storage areas, structures and other buildings.

Monitoring Wells

There is one shallow monitoring well (IR78-GW33) that was installed during the RI, adjacent to Building HP908 (Figure 2-1). This monitoring well is located upgradient of Building HP908, considering that the general groundwater movement at Site 78 is east to west across the site.

Underground and Above Ground Storage Tanks

A former above ground acid tank, and a below ground sludge trap and grease trap were found during the Environmental Literature Review on historical blueprints. These tanks were located between Buildings HP908 and HP909 as shown in Appendix E, Figure HP908-6.

There are no known UST program sites on or directly adjacent to Building HP908.

2.2.2.2 Operational History

The following sections describe the past and present use at building HP908 and are also summarized in Table 2-3.

Building HP908 was constructed as a Standard Butler Building in 1948. It was originally used as a storage building for electronic equipment. Shortly after its construction, plans were drawn proposing to convert the building into a Vehicle Paint and Undercoat Shop (Appendix E, Figures HP908-1 and HP908-2). In 1952 the building was converted into a Paint Shop with a paint spray booth and a bake oven, during which time an addition was added onto the existing building (Appendix F, Figure HP908-3). The original plans included an undercoating facility, however, it is unknown if the undercoating facility was included in the building. Prior to this time there was no central paint shop on the Base. Paint spraying operations were conducted in Buildings HP1201, HP1401, HP1502 and HP1601. In 1982 paint-spraying operations in the HPIA were performed in Buildings HP908, HP1103 and HP1202. In 1989 the work performed in Building HP908, then referred to as the Central Paint or Body Shop, was described as consisting of vehicle painting and general body repair.

As shown on drawings from 1951, a bake oven was installed and building plans indicate a new acid tank, new sludge trap, and a new sewer between Buildings HP908 and HP909 (Appendix E, Figures HP908-4, through HP908-6). The acid tank, new sludge tank and existing grease trap are

drawn in more detail on Figure HP908-7, and show that the acid tank is above ground while the sludge trap and grease pit are below ground.

Building plans indicated that in the 1960s there was a small metal building located between Buildings HP908 and HP909 that was used for paint stripping. This building may be the small metal building in the vicinity of Building HP908 that was used to store chemicals and paint, as documented during a 1986 inspection of the area by ESE. During the most recent site visit a paint locker was identified on the north side of the building as shown in Appendix B, Photo 11.

Building HP908 was totally renovated in 1992. A drawing of the floor layout from 1992 (Appendix E, Figure HP908-8) shows that the baking oven was to be removed, while the spray booth was to remain. The current use of this building is an automotive/vehicle shop.

According to the above mentioned drawings and the Environmental Literature Review (Dolph, October 2001), the following equipment was used in Building HP908:

- Spray Painting Equipment
- Spray Booth
- Baking Oven
- Air Compressor
- Acid Tank
- Sludge Trap
- Grease Trap

According to the above mentioned drawings and the Environmental Literature Review (Dolph, October 2001), the following operations were conducted in Building HP908:

- Storage
- Paint Spraying
- Vehicle Body Repair

During the site visit a small structure was identified as storing paint, as shown in Appendix B, Photos 11 and 12. There was no visual evidence of a release from this storage structure. Miscellaneous debris and storage and raised structures were also identified during the site visit as shown in Appendix B, Photo 8. The raised structures are probably a ventilation system for the building.

2.2.2.3 Waste Characteristics

The following are known chemicals/compounds that were used or stored in Building HP908 (Dolph, October 2001):

- Paint (estimated one ton annually)
- Lacquer Thinner Stock Number 8010-00-165-55401
- Mineral Spirits Stock Number 8010-00-2089
- Contaminated Waste Water
- Solvents

2.2.2.4 Waste Quantity

Known disposal practices with estimated waste quantities are listed on Table 2-4. As shown, all records indicate that waste was taken to the Base Chemical Landfill, the Hadnot Point Burn Dump, or to the DRMO. This list may not include all wastes that were generated at this facility. There are no records of waste disposal before 1976 when painting chemicals were used in this building, and therefore, it is unknown exactly how wastes were disposed of at this building. During the site visit a dumpster was identified west of the building and described as containing solid waste.

Previous Investigations

As mentioned earlier, numerous environmental investigations were conducted throughout the HPIA. Information detailing previous investigations performed in the area of Building HP908 is included in Appendix F.3, HP908 and is summarized below:

Soil Gas Investigation

• Soil borings were advanced surrounding the perimeter of Building HP908 during the RI (Baker, June 1994). The analytical results indicated detections of total VOCs ranging from non-detect to 3.3 ppb. Findings of the soil gas investigation, including a figure of sampling points and analytical data, are presented in Appendix F.7.

One monitoring well (IR78-GW33) was installed along the perimeter of Building HP908 during the RI (Baker, June 1994), and groundwater was sampled and analyzed for TCL VOCs and Target Analyte List (TAL) inorganics (total and dissolved metals and cyanide). VOCs were not detected, while inorganics were detected. Select inorganics including aluminum, calcium, and iron were detected at concentrations exceeding 10 mg/L, while other inorganics were detected at lower concentrations, or below the required detection limit. This monitoring well is currently not sampled under the LTM program, however, static water levels are regularly measured at this well. Positive detection summaries in groundwater from the RI, and well construction records for monitoring well IR78-GW33 are presented in Appendix F.8.

Subsurface Soil Samples

• Subsurface soil samples (i.e., below one-foot) were collected from the boring advanced for monitoring well IR78-GW33 during the RI, and were analyzed for VOCs, SVOCs, pesticides, PCBs and inorganics (Baker, June 1994). SVOCs, pesticides and PCBs were not detected in soils. TAL inorganics were detected in the samples, with select inorganics including aluminum and iron exceeding concentrations of 1,000 mg/kg, while other inorganics were detected at lower concentrations, or below the required detection limits. Acetone was detected, but was determined in the RI report to be a laboratory contaminant. Findings of the soil borings, including analytical results, are presented in Appendix F.8.

2.2.3 Building HP1120

2.2.3.1 <u>Site Description</u>

Building HP1120 is located in the middle of Site 78 near the northern portion of the site, between Hammond Road, Birch Street, and Ash Street as shown on Figures 1-1 and 2-1. It is a one story metal and concrete building surrounded by fencing, and has several bays (Appendix B, Photos 13 through 17) with dimensions of approximately 375 ft. X 30 ft. Adjacent areas consist of pavement, asphalt, grass, storage areas, and other buildings including PA Site HP1124. During the site visit, debris and miscellaneous storage were identified as shown in Appendix B, Photo 13.

Monitoring Wells

There is one monitoring well (IR78-GW16) located northwest of Building HP1120 as shown on Figure 2-1. This monitoring well is located somewhat downgradient of Building HP908, considering that the general groundwater movement at Site 78 is east to west across the site. Monitoring well IR78-GW16 was installed during the CS to monitor Building HP1202 after a soil gas investigation identified high levels of TCE in the vicinity of Building HP1202.

Aboveground and Underground Storage Tanks

One AST was found during the Environmental Literature Review and is also described as being installed pre-1972, having a capacity of 1,000 gallons, and to have contained waste oil. No ASTs were identified surrounding the building during the most recent site visit.

There are two former UST Sites (1106 and S1213/1205) and one active UST Site [Hadnot Point Fuel Farm (HPFF)] in the vicinity of Building HP1124. (Refer to Appendix C for UST information in the area of Building HP1124.)

2.2.3.2 Operational History

The following sections describe the past and present use at building HP1120 and are summarized in Table 2-5.

Building HP1120 was constructed as an Automobile Hobby Shop in 1955. According to original as-built drawings, the building was configured with the following work areas (Appendix E, Figure HP1120-1):

- Repair Shop
- Tool Room
- Parts Room
- Equipment Room

An addition was constructed in 1964 (Appendix E, Figure HP1120-2) and again in 1969 (Appendix E, Figure HP1120-3) to serve as a classroom.

Operations conducted in this building include automotive repair and painting. Known machinery used in the building are grease racks and vehicle lifts.

Previous Investigations

As mentioned earlier, numerous environmental investigations were conducted throughout the HPIA. Information detailing previous investigations performed in the area of Building HP1120 is included in Appendix F.4, HP1120 and summarized below:

Monitoring Well Installation and Sampling

As mentioned previously, monitoring well IR78-GW16 is located near Building HP1120. Monitoring well IR78-GW16 was analyzed during the RI for TCL VOCs and TAL inorganics (Baker, June 1994). The data from the RI indicates that VOCs were not detected, while a number of total and dissolved inorganics were detected. Select total inorganics including calcium, iron, magnesium, and potassium exceeded 10 mg/L, and aluminum was detected at 341 mg/L, while other inorganics were detected at lower concentrations or below the required detection limit. Select dissolved inorganics including calcium, magnesium, and sodium were detected at concentrations above 1 mg/L, while other dissolved inorganics were detected at lower concentrations, or were not detected. Although this monitoring well is currently inactive, static water level elevations are taken during the LTM program. Monitoring well IR78-GW16 construction details and analytical data from the RI are included in Appendix F.9.

2.2.3.3 Waste Characteristics

Known chemicals/compounds used in this building are as follows (Dolph, October 2001):

- Automotive Grease
- Oil
- Waste Oil
- Paint

This list may not include all wastes that were generated at this facility. Other compounds that may have been used or stored in this building include paint thinners, parts cleaning wastes (solvents and parts washers), automotive batteries, and shop cleaning wastes (floor cleaning

wastes, absorbents used for spills or leaks and shop rags). During the most recent site visit materials that were identified include paints, oils, lubes, and hydraulic fluids.

2.2.3.4 Waste Quantity

Known disposal practices with estimated waste quantities are listed on Table 2-6. As shown, the records indicate that the AST was pumped out by Base Maintenance, except for waste oil (including solvents) that was reportedly sprayed on unimproved roads all over the Base. However, there are no records of waste disposal before 1976, and therefore, it is unknown exactly how all wastes were disposed of at this building.

2.2.4 Building HP1124

2.2.4.1 <u>Site Description</u>

Building HP1124 is located in the middle of Site 78 near the northern portion of the site, between Hammond Road, Birch Street, and Ash Street as shown on Figures 1-1 and 2-1. It is a metal and concrete open bay garage located inside a fenced compound (Appendix B, Photos 18 through 23) with dimensions of approximately 96 ft. X 40 ft. Adjacent areas consist of pavement, asphalt, debris and other buildings including PA Site HP1120.

Monitoring Wells

As discussed previously for Building HP1120, the closest monitoring well is IR78-GW16, located northwest of Building HP1124. This monitoring well is located somewhat downgradient of Building HP1124, considering that the general groundwater movement at Site 78 is east to west across the site.

Aboveground and Underground Storage Tanks

As discussed previously for Building HP1120, there are two former UST Sites (1106 and S1213/1205) and one active UST Site (HPFF) in the vicinity of Building HP1124. (Refer to Appendix C for UST program information in this area.)

A 500 gallon AST containing waste oil and antifreeze was studied inside Building HP1124 by the SWMU Program (Baker, November 2001). During a site visit conducted by Baker in 1996 for the SWMU investigation, spills/stains were noted on the concrete flooring of the open-bay garage structure housing the AST. An oil/water separator was also studied by neighboring Buildings 1106 and 1107.

2.2.4.2 Operational History

The following sections describe the past and present use at Building HP1124, and are also summarized in Table 2-7.

Building HP1124 was constructed in 1970 as an automobile repair shop (Appendix E, Figure HP1124-1). The structure basically consists of open bays. During the site visit, a paint spray booth and hydraulic lifts were identified, as shown in Appendix B, Photos, 19 and 23. A metal structure labeled hazardous waste storage was also identified in the parking lot near Buildings HP1120 and HP1124, as shown in Appendix B, Photo 22. Some staining is noticed on the asphalt around the hazardous waste storage structure.

Previous Investigations

Site Waste Management Units

As mentioned previously, a 500 gallon AST containing waste oil and antifreeze was investigated in Building HP1124 under the SWMU Program (SWMU No. 292) and an oil/water separator was studied near Buildings 1106 and 1107 (SWMU No. 293). Four soil borings were advanced around the perimeter of the buildings and analyzed for VOCs, SVOCs, and RCRA metals. In the soil sample set closest to Building HP1124 the following was detected: VOCs (acetone 860 ug/kg and methylene chloride 2J to 6.1 ug/kg), SVOC (bis(2-ethylhexyl)phthalate 120 J ug/kg), and metals (chromium 4.1 to 6.2 ug/kg, lead 2.2 to 4 ug/kg, mercury 0.071 ug/kg and selenium 0.64 ug/kg). The SWMU report determined that the detections were all below the screening criteria, and no further investigations were warranted for SWMU No. 292. For complete SWMUs 292 and 293 investigation information, including analytical results, refer to Appendix H.1.

2.2.4.2 Waste Characteristics

No records were found during the Environmental Historical Review to document known wastes used in this building. From the SWMU investigation, however, it is known that oil and antifreeze was stored in this building (Baker, November 2001). Used oils may contain heavy metals, and antifreeze contains ethylene glycol and lead.

It is suspected that other compounds may have been used/stored in this building including automotive batteries, parts cleaning wastes (solvents and parts washers), and shop cleanup wastes (floor cleaning wastes, absorbents used for spills or leaks and shop rags). During the site visit a number of materials were identified including paints, oils, lubes, and hydraulic fluids.

2.2.4.3 Waste Quantity

It is known that the AST in Building HP1124 can hold 500 gallons of waste oil and antifreeze. The amount of wastes (oil, antifreeze) generated at this facility over a period of time is unknown.

2.2.5 Building HP1409

2.2.5.1 <u>Site Description</u>

Building HP1409 is located in the southern area of Site 78, between Buildings HP1404 and HP1403 on Gibb Road, as shown on Figures 1-1 and 2-1. It is a one story concrete and cinder block building that is fenced inside a compound, and has open bays (Appendix B, Photos 24 through 26) with dimensions of approximately 157 ft. X 28 ft. Adjacent areas consist of pavement, concrete, grass, open storage, and other buildings.

Monitoring Wells

There are no monitoring wells located in the area of Building HP1409. The closest monitoring well is IR78-GW10 located near Building 1502 on Elm Street (Figure 2-1). This monitoring well is located somewhat downgradient of Building HP1409, considering that the general groundwater movement at Site 78 is east to west across the site.

Aboveground and Underground Storage Tanks

There are no known USTs in the area of Building HP1409. There is an active UST Site associated with Building 1502 located southwest of Building HP1409 across Elm Street. There are several monitoring wells associated with Building HP1502 near Elm Street. (Refer to Appendix C for UST Program information.)

During the site visit several ASTs were identified adjacent to Building HP1409 as shown in Appendix B, Photo 26. As shown, there is a small shed with fencing surrounding the area that stores ASTs. The contents and capacity of the ASTs and containers are unknown; however, they appear to be rusting as shown on Photo 26.

2.2.5.2 Operational History

The following sections describe the past and present use at Building HP1409 and are also summarized in Table 2-9:

Building HP1409 was constructed in 1943 as a Storage Building. In the late 1940s, it housed the Upholstery and Carpenter Shop and was operated by the Reclamation and Salvage Division. The Upholstery Shop handled the repair of upholstery and re-upholstering of all government furniture located in officers' quarters and other buildings within the Base. Slipcovers were manufactured and canvas and leatherwork was performed in this building. The Carpenter Shop repaired office furniture, household furniture, barracks boxes, mess tables and benches. The Upholstery and Carpenter Shop were relocated from Building HP1409 in 1951 (WAR, April 1983). The floor layout from 1943 is illustrated in Appendix E, Figure HP1409-1.

The 1959 Base lists Building HP1409 as a decontamination building. Plans could not be located to describe the use of decontamination. The building was most likely used to store material for defense operations.

In the years to follow, Building HP1409 was used as a Classroom, a Public Works Storage facility and a Furniture Repair Shop (Appendix E, HP1409-2). The Furniture Repair Shop contained a 550-gallon vat of paint stripper that was used to remove clear finishes (lacquer and varnish) on wood (WAR, April 1983). The paint stripper was disposed of by being placed in 55 gallon drums and then transported to the Fly Ash Dump where it was poured on the ground (WAR, 1983).

Currently, the building houses a military Boat Shop where small boats are repaired, including minor hull repair, and inboard and outboard engine repair as shown in Appendix B, Photo 25.

The following is a list of known machinery used in Building HP1409 in the past (Dolph, October 2001):

Carpenter Shop

- Circular Saws
- Band Saws
- Joiners
- Grinders
- Boat Engine Repair Related Tools

The following is a list of known operations conducted in Building HP1409 (Dolph, October 2001):

- Furniture Repair
- Upholstery Work
- Carpenter Work
- Instruction
- Storage
- Administrative
- Boat and Engine Repair

Previous Investigations

As mentioned earlier, numerous environmental investigations were conducted throughout the HPIA. Previous investigations were conducted at neighboring buildings during the CS and RI, however, no known investigations or samples were analyzed near Building HP1409. These investigations were performed at Buildings HP1502, HP1601 and HP1602 which have been vehicle maintenance and repair facilities since initial construction at the Base (circa 1942 - 1943). The following is a list of investigations that have been performed at these neighboring buildings.

Soil Gas Investigation

A soil gas investigation was performed during the CS to study the area of Buildings HP1502, HP1601 and HP1602 (ESE, April 1992). Soil gas borings were advanced around these buildings and TCE was detected in several samples with levels as high as 73,000 ug/L. Findings of the soil gas investigation including a figure of sampling points and analytical results are presented in Appendix F.10.

Soil Borings

Soil borings were advanced around the area of Buildings HP1502, HP1601 and HP1602 during the CS and analyzed for VOCs, SVOCs, inorganics, pesticides and PCBs (ESE, April 1992). VOCs, including TCE, were found in the majority of the samples surrounding these buildings. Findings of the soil boring investigation are presented in Appendix F.11.

Monitoring Well Installation and Sampling

There are no known monitoring wells located in the area of Building HP1409. The closest monitoring well is IR78-GW10 located near Building 1502 on Elm Street (Figure 2-1), approximately 800 feet away. This monitoring well is located somewhat downgradient of Building HP1409 considering that the general groundwater flow is east to west across Site 78. Monitoring well IR78-GW10 was sampled during the CS for VOCs, SVOCs, inorganics, pesticides and PCBs. VOCs, SVOCs, pesticides and PCBs were not detected, while inorganics were detected in monitoring well IR78-GW10. Select inorganics that were detected above 10 mg/L include calcium, magnesium and potassium, while aluminum and iron were detected in excess of 100 mg/L. Analytical results from the CS are included in Appendix F.12.

Monitoring well IR78-GW10 is also sampled regularly through the LTM Program for VOCs. This well has shown consistent non-detections of VOCs since January 1999, previous to this date there have been minor detections of VOCs. Analytical results from the LTM Program and well construction details for monitoring well IR78-GW10 are presented in Appendix F.1.

2.2.5.3 Waste Characteristics

The following is a list of known chemicals/compounds used or stored in Building HP1409 (Dolph, October 2001):

- Paint Stripper
- Hydraulic Fluid (Stock Number 9159-00-698-2382)
- Penetrating Fluid (Stock Number 6859-00-985-7180)
- Gear Case Oil

Fuels and oils were identified at this building during the site visit.

2.2.5.4 Waste Quantity

Known disposal practices are listed on Table 2-10. As shown, the records indicate that in 1945 trash was collected Base wide (general refuse) daily and hauled to incinerators or open burning dumps. In addition, paint stripper was disposed of in the Fly Ash dump during 1982. It is unknown, however, how waste oil was disposed of at this facility. During the period of 1945 to 1949 this facility was a carpentry shop, and waste oils may have been potentially produced from the use of machines.

2.2.6 Building HP1512

2.2.6.1 Site Description

Building HP1512 was supposedly located between Buildings HP1504 and HP1503 on Hammond Road, however, during a recent visual inspection this structure could not be located. The former location of this building is shown on Figures 1-1 and 2-1. It is assumed that HP1512 was most likely an automotive repair support structure because Buildings HP1503 and HP1504 are part of a series of vehicle maintenance buildings with parts cleaning tanks and wash racks located between them. The area where HP1512 was located is now a concrete staging pad and is being used as a storage area for drums and tires. Fencing surrounds the area of former Building HP1512. Adjacent areas consist of pavement, concrete, grass and other buildings (Appendix B, Photos 27 and 28).

Monitoring Wells

There is one monitoring well (IR78-GW11) located south of the former structure HP1512, across Hammond Road, approximately 100 feet away. This monitoring well is located somewhat downgradient of former Building HP1512 considering that the general groundwater flow is east to west across Site 78. This monitoring well is sampled regularly through the LTM program for VOCs. Analytical data from this well show consistent non-detections. Well construction details and analytical results for monitoring well IR78-GW11 are presented in Appendix F.1, HPIA.

Underground and Aboveground Storage Tanks

There are no known USTs in the area of former structure HP1512. There is an active UST Site at Building HP1502 located north of former structure HP1512 with associated monitoring wells as outlined in Appendix C. Drums were identified during the site visit, as described below.

2.2.6.2 Operational History

Operational history is unknown for this structure, however, it is assumed that it was used as an automotive repair support structure for the series of vehicle maintenance buildings in this area (Table 2-11).

As shown in Appendix B, Photos 27 and 28, this area is being used as open storage for drums and tires and as vehicle maintenance support. As identified during the site visit, there are approximately seventy-five tires in this area, and fifteen, fifty-five gallons drums. The drums are described as being empty, with no visual evidence of a release. A drainage swale is also immediately adjacent to the concrete pad staging area for the drums and tires.

2.2.6.3 Waste Characteristics

Waste characteristics are unknown for this structure. It is assumed that this was some type of vehicle support structure, either a vehicle wash rack, cleaning tank, or possibly a storage area. If this structure was a vehicle support area, it could have the potential for a number of wastes including waste oils, waste water from vehicles or cleaning parts, or solvents for cleaning parts. During the site visit Petroleum-Oil-Lubricants (POLs) were identified at this area.

Previous Investigations

Previous investigations were conducted at neighboring buildings of the former structure HP1512 during the CS and the RI; however, no known samples were analyzed near structure HP1512. These investigations were performed for Buildings HP1502, HP1601 and HP1602, which have been vehicle maintenance and repair facilities since initial construction at the Base (circa 1942 - 1943). (Refer to the previous section for Building HP1409 that discusses the soil gas investigation and soil borings performed during the CS.)

Monitoring Well Installation

Monitoring well IR78-GW11 is located south of the former structure HP1512 across Hammond Street. Monitoring well IR78-GW11 was sampled during the CS and analyzed for VOCs, SVOCs, inorganics, pesticides and PCBs. SVOCs, pesticides, and PCBs were not detected, while one VOC was detected (carbon disulfide 11 ug/L), and inorganics were detected. Select inorganics that exceeded 10 mg/L include aluminum, iron and magnesium, while other inorganics were detected at lower concentrations, or below the required detection limit. Analytical data for monitoring well IR78-GW11 from the CS is included in Appendix F.12.

This well is also regularly sampled during the LTM program for VOCs and has historically shown non-detections of VOCs. Analytical results from the LTM Program are presented in Appendix F.1, HPIA.

2.2.6.4 Waste Quantity

Former Building HP1512 operational history, waste characteristics and waste disposal are relatively unknown.

2.3 Air Station Sites

The PA Sites located on the Air Station portion of the Base are associated with Buildings TC830, SAS113, AS118, AS116 and AS119 as illustrated on Figure 2-7. As mentioned previously, these PA Sites have not been investigated under the IR program and are not located within an existing OU. IR Sites 44, 75, 76, 89 and 93, however, are located north of the PA Sites.

SWMU No. 299 is an AST near Buildings AS114 and PA Site AS116. The SWMU program is currently investigating an AST in this area.

There are also a number of UST Program Sites under investigation at the Air Station, that are in close proximity to PA Sites SAS113, AS116 and AS119 as presented in Appendix C.

The land within the Air Station PA Sites is relatively flat. The installation of drainage ditches, storm sewers, and extensive paving typically have altered natural drainage. Surface runoff from the sites not intercepted by a manmade structure may drain to Edwards Creek. Previous investigations at nearby IR Sites 75 and 76 indicate that groundwater in this area generally flows towards Edwards Creek. Topographic contour elevations are illustrated on Figure 2-7 for the Air Station PA Sites. A recent aerial photo is illustrated on Figure 2-8 and shows the land features of the PA Sites. As shown, the area surrounding the PA buildings is paved and there are drainage ditches that surround the area.

2.3.1 Building TC830

2.3.1.1 <u>Site Description</u>

Building TC830 is located north of IR Site 93, on the corner of Eighth Street and C Street as shown on Figures 1-1 and 2-7. It is a one story concrete cinder block building (Appendix B, Photos 29 through 32) with dimensions of 108 ft x 24 ft. Adjacent areas consist of pavement, gravel, grass and other buildings.

Monitoring Wells

There are no known monitoring wells in close proximity to Building TC830. However Site 93 is located directly south of Building TC830 where several monitoring wells are located.

Aboveground and Underground Storage Tanks

There are no known ASTs or USTs in close proximity to Building TC830.

2.3.1.2 Operational History

The following sections describe the past and present use at Building TC830 and are also summarized in Table 2-12.

Building TC830 was constructed in 1943 as a Storehouse, as illustrated on blueprints included in Appendix E, Figure TC830-1. This building was constructed from standardized plans and consists of a metal frame and siding. Over the years this building has been listed as a storage building, a classroom, and a dry cleaning plant for the Marine Corps Exchange. This building was listed as a Laundry and Dry Cleaning Plant. The IAS states that numerous laundry distribution centers were located throughout the Base that did not perform dry cleaning operations, and all dry cleaning operations were performed at Building 25 (WAR, April 1993). The Environmental Literature Review verified that all dry cleaning operations at the Base were performed at Building 25 by reviewing the 1976 Naval Environmental Protection Support Service Air Emission Master File Summary (Dolph, October 2001).

2.3.1.3 Waste Characteristics

No information was found during the Environmental Literature Review or field reconnaissance to indicate that any hazardous wastes were used or disposed of at Building TC830. There are also no known environmental investigations that were performed in the vicinity of Building TC830. The Environmental Literature Review verified that this facility did not perform dry cleaning operations, and therefore, dry cleaning chemicals are not suspected at this building. However, it is not clear as to what was stored in this building during the 1940's and during the 1970's when the building is listed as providing open storage.

2.3.1.4 Waste Quantity

The only known disposal practice at Building TC830 was the daily trash removal that was taken to incinerators or open burn dump for disposal as presented on Table 2-13. Dry cleaning operations were not performed at this building, and therefore, there are no potential dry cleaning waste quantities.

2.3.2 Building SAS113

2.3.2.1 <u>Site Description</u>

Building SAS113 is located south of IR Sites 75 and 76, between Buildings AS114 and AS118 west of Bancroft Road as shown on Figures 1-1 and 2-3. It is an four bay open metal structure erected on a 6 inch slab (Appendix B, Photos 33 through 36) with dimensions of 100 ft x 24 ft. Fencing surrounds the building, and some debris was noticed during the site visit as shown in Appendix B, Photo36. Run-off from the building was also identified during the site visit, as shown on Photos 33 and 34. Adjacent areas consist of pavement, asphalt, and other buildings.

Monitoring Wells

There are no known IR program monitoring wells located in this area of the Base, however, there are UST Program monitoring wells in this area.

Underground and Aboveground Storage Tanks

There are no known ASTs or USTs associated with Building SAS113, however, there are UST Program Sites in this area of the Base as presented in Appendix C.

2.3.2.2 Operational History

The following sections describe the past and present use at Building SAS113 and are also summarized in Table 2-14.

Building SAS113 was constructed in 1986 when surrounding Buildings AS114, AS116 and AS118 were converted into automotive hobby shops. Building SAS113 primarily serves as an outside work and storage area for the automobile hobby shops. Known machinery used at Building SAS113 are small vehicle jacks to provide vehicle repair support.

2.3.2.3 Waste Characteristics

Records of chemical/compounds used or stored in Building SAS113 were not found during the Environmental Literature Review. Since this is a vehicle support area, it is suspected that any number of automobile repair wastes are used or stored here and may include the following: waste oil, antifreeze, parts cleaning wastes (solvents and parts washers), automotive batteries, and shop cleaning wastes (floor cleaning wastes, absorbents used for spills or leaks and shop rags). During the site visit POLs were identified at the building.

2.3.2.4 Waste Quantity

No records were found during the Environmental Literature Review to document wastes or disposal practices at Building SAS113. It is uncertain how the vehicle repair related wastes are used and disposed of at this structure.

2.3.3 Building AS116

2.3.3.1 <u>Site Description</u>

Building AS116 is located south of IR Sites 75 and 76, west of Bancroft Road near Building AS114 as shown on Figure 1-1 and 2-3. It is a one story metal frame building with siding that has four bays, and is attached to a brick structure (Appendix B, Photos 37 through 42) with dimensions of approximately 70 ft x 51 ft. Fencing surrounds the building, with access from Bancroft Street only. Adjacent areas consist of pavement, asphalt, and other buildings.

Monitoring Wells

There are no known IR program monitoring wells located in this area of the Base, however, there are UST Program monitoring wells in this area.

<u>Underground and Aboveground Storage Tanks</u>

There are no known USTs associated with Building AS116, however, there are UST Program Sites in this area of the Base as presented in Appendix C.

During the site visit, an open storage area (shed) was identified as storing drums and equipment, as shown in Appendix B, Photos 39 and 40. The storage area contains approximately fifteen drums that are described as being in good condition and are currently empty, with no visual evidence of a release.

2.3.3.2 Operational History

The following sections describe the past and present use at Building AS116 and are also summarized in Table 2-15.

Building AS116 was constructed in 1954 to provide the Air Station with vehicle maintenance facilities. A floor plan drawing of AS116 is illustrated in Appendix E, Figure AS116-1. This building replaced a temporary wooden building.

From 1979 to 1981 Building AS116 served as a Hazardous and Flammables storage area.

In the early 1980s, a new complex was constructed for the Combat Vehicle Maintenance Shop, and Building AS116 was converted into an automotive hobby shop along with Buildings AS113 and AS114. During the site visit a paint booth was identified inside Building AS116.

Previous Investigations

Site Waste Management Unit

No known investigations have been performed at Building AS116 or surrounding buildings, however, SWMU No. 299 is near Building AS116. SWMU No. 299 is an AST associated with Building AS114. Samples collected in the area of the AST detected VOCs ranging from 71 to 4,300 ug/L, SVOCs ranging from 640 J to 16,000 ug/L, and inorganics. The concentrations were detected in excess of the SWMU screening criteria and are currently being investigated further. Findings of the SWMU No. 299 investigation are presented in Appendix H.2.

2.2.3.3 Waste Characteristics

Records of chemicals/compounds used or stored in Building AS116 were not found during the Environmental Literature Review. Since this is a vehicle support area, it is suspected that any number of automobile repair wastes are used or stored here and may include the following: waste oil, antifreeze, parts cleaning wastes (solvents and parts washers), automotive batteries, and shop cleaning wastes (floor cleaning wastes, absorbents used for spills or leaks and shop rags). This building is also listed as a paint shop and may include the following wastes associated with painting: paint thinners and waste paint. Paint and POLs were identified at this building during the site visit.

In addition to supplying vehicle support, this area was also used to store hazardous and flammable materials. There are no records of the types of hazardous and flammable materials stored in Building AS116.

2.2.3.4 Waste Quantity

No records were found during the Environmental Literature Review to document wastes or disposal practices at Building AS116. It is uncertain how the vehicle repair related wastes, and potentially hazardous and flammables materials were used and disposed of at this structure.

2.2.4 Building AS119

2.2.4.1 <u>Site Description</u>

Building AS119 is located south of IR Sites 75 and 76 and west of Bancroft Road, as shown on Figures 1-1 and 2-7. It is a one story metal frame building with siding (Appendix B, Photos 43 through 49) with dimensions of approximately 120 ft x 24 ft. Fencing surrounds the area of the building. Adjacent areas consist of grass, pavement, asphalt, and other buildings.

Monitoring Wells

There are no known IR program monitoring wells located in this area of the Base, however, there are UST Program monitoring wells in this area as shown in Appendix C.

<u>Underground and Aboveground Storage Tanks</u>

An AST used for the heating system was discovered during the Environmental Literature Review. There are also UST Program Sites in this area of the Base as presented in Appendix C. This AST was verified during the site visit as shown in Appendix B, Photo 43.

2.2.4.2 Operational History

The following sections describe the past and present use at Building AS119 as summarized in Table 2-16.

Building AS119 was constructed in 1963 as an Automotive Vehicle Maintenance Facility. Plans indicate that the floor layout included the following areas:

- Office
- Toilet
- Parts Storage
- Service Bays
- Exterior Service or Wash Rack

In 1988 the building was configured with the following areas (Appendix E, Figure AS119-1 through AS119-3):

- Weight Room
- Licensing Room
- Lounge
- Office
- Duty Office
- Toilet
- Tire Shop
- Exterior Service or Wash Rack

During the work performed in 1988, a number of structures were removed from the building or updated as shown in Appendix E, Figure AS119-1. An existing oil heater and associated piping and valves were replaced with a new fuel oil storage tank with a capacity of 250 gallons (Appendix E, Figure AS119-2). The new AST is on a concrete pad as shown in Appendix E, Figure AS119-3 and Appendix B, Photo 43.

Currently, the area is described as a storage facility and no maintenance work was identified during the site visit. A wash rack was identified during the site visit with run-off, as shown in Appendix B, Photos 44 and 45.

2.4.2.3 Waste Characteristics

Records of chemicals/compounds used or stored in Building AS119 were not found during the Environmental Literature Review. Since this is a vehicle support area it is suspected that any number of automobile repair wastes are used or stored in this building and may include the following: waste oil, antifreeze, paints, paint thinners, parts cleaning wastes (solvents and parts washers), automotive batteries, and shop cleaning wastes (floor cleaning wastes, absorbents used for spills or leaks and shop rags).

2.4.2.4 Waste Quantity

No records were found during the Environmental Literature Review to document wastes or disposal practices at Building AS119. It is uncertain how the vehicle repair related wastes, were used and disposed of at this structure. During the site visit a number of trash dumpsters were identified as shown in Appendix B, Photo 49. There are approximately eight to ten dumpsters and are described as empty and in good condition, there was also no visual evidence of a release during the site visit. The site visit also verified that currently, any waste oil generated at this facility is transported to Building AS114 (Auto Hobby Shop).

2.5 Montford Point Sites

The PA Sites located on the Montford Point portion of the Base are associated with Buildings M119 and SM173 as illustrated on Figures 1-1 and 2-9. As mentioned previously, these PA Sites have not been investigated under the IR program and are not located within an existing OU. However, IR Sites 7, 16 and 85 are located in this area of the Base.

There is a one UST Program Site associated with Building M90 in this area of the Base as presented in Appendix C.

The land within the area of the PA Sites is relatively flat. The sites are located west of Northeast Creek. Surface runoff from the sites drains to this creek, and eventually flows to the New River. Topographic contour elevations are illustrated on Figure 2-9 for the Montford Point PA Sites. A recent aerial photo is illustrated on Figure 2-10 and shows the land features of the PA Sites. As shown, the area surrounding the PA buildings is paved and woods surround the area to the south and west.

2.5.1 Building M119

2.5.1.1 <u>Site Description</u>

Building M119 is located at the intersection of Landing Road and Wilson Drive as shown on Figure 1-1 and 2-9. It is a one story concrete and wood building and has three bays (Appendix B, Photos 50 through 53) with dimensions of 133 ft x 46 ft. Adjacent areas consist of paved and unpaved roads, grass, and other buildings.

Monitoring Wells

There are no known monitoring wells located in close proximity to Building M119.

<u>Underground and Aboveground Storage Tanks</u>

There is one AST and one UST that were discovered during the Environmental Literature Review (Dolph, October 2001). The AST is described as being constructed of steel, containing fuel oil, and used for heating purposes. The UST is described as being installed before 1967, constructed of steel, having a capacity of 1,000 gallons and contained regular gasoline in 1974 and unleaded gasoline. The purpose of the UST was for vehicle fuel. Reportedly, in 1989 the UST could not be located and it was believed to be located at structure SM193. Plans and specifications to remove the tank and dispensing pump were prepared in 1991 as shown in Appendix E, Figures M119-1 and M119-2.

In addition to the fuel oil AST, a diesel AST was identified on the west side of the building as shown in Appendix B, Photo 51. The capacity of the tank is 500 gallons, and appears to be new.

2.5.1.2 Operational History

The following sections describe the past and present use at Building M119 as summarized in Table 2-17.

Building M119 was constructed in 1943 as one of four Gun Sheds that were constructed adjacent to each other on Wilson Drive, as shown in Appendix E, Figure M119-3. The types of guns stored in the buildings were most likely Howitzers. Over the years the building has been renovated, and has been used as a classroom and vehicle repair shop. As shown on historical drawings from 1988, (Appendix E, Figure M119-4) there are a number of fuel oil tanks that are used for heating this building.

Operations conducted in Building M119 includes:

- Parts Cleaning
- Classroom
- Vehicle Repair
- Gun Preservation

Previous Investigations

There are no known previous investigations that have been performed at this building.

2.5.1.3 Waste Characteristics

The following are known chemicals/compounds that were used or stored in Building M119 (Dolph, October 2001):

- Safety Kleen Solvent
- Waste Oil
- Vehicle Repair Related
- Gasoline

Potential chemicals/compounds that were used or stored at this building during the time that it stored guns may be gun preservation materials. Vehicle repair related materials may include: paint and paint thinners, parts cleaning wastes (solvents and parts washers), automotive batteries, automotive oils, and shop cleaning wastes (floor cleaning wastes, absorbents used for spills or leaks and shop rags).

2.5.1.4 Waste Quantity

Known disposal practices, with estimated waste quantities, are listed on Table 2-18. As shown, the records indicated that in 1945 trash was collected Base wide (general refuse) daily and hauled to incinerators or open burn dumps. Waste oils (including solvents) were sprayed on unimproved roads on the Base, and the solvents used in Building M119 were disposed of via the Safety Kleen Company. In addition, waste oils from both Buildings M119 and M120 were deposited into a UST at an estimated rate of 2,045 gallons annually. The location and status of the waste oil UST is uncertain, and this is probably not the same UST that was planned for removal as mentioned earlier. The UST plans from 1991 specify that the tank being removed contained gasoline for the vehicles in the area. Historical documentation dating back to August 1976 revealed that a spill occurred while filling a UST at Building M119. Approximately 200 gallons of gasoline overflowed during a fuel transfer operation. It was also reported that the spill was contained in a nearby ditch and cleaned up by Base maintenance personnel by removing the contaminated soil and subsequently back-filled and seeded. Refer to Appendix F.13 for the spill report from the Base.

2.5.2 Building SM173

2.5.2.1 Site Description

Building SM173 was located west of Landing Road as shown on Figures 1-1 and 2-9. It was a small shed with dimensions of 14 ft x 10 ft. This area currently houses a concrete wash rack that is used to wash vehicles (Appendix B, Photos 54 and 55). Adjacent areas consist of pavement, and grass.

Monitoring Wells

There are no known monitoring wells in close proximity to the area of former Building SM173.

Aboveground and Underground Storage Tanks

There are no known ASTs or USTs in close proximity to former Building SM173.

2.5.2.2 Operational History

The following sections summarize the operational history of former Building SM173 as summarized on Table 2-19.

Former structure SM173 was constructed in 1962 by Base personnel to house a Steam Generator, also known as a Steam Jenny. Steam Jennys were used to assist with washing vehicles throughout the Base.

Previous Investigations

No known investigations have been performed for former structure SM173. However, the SWMU program is currently investigating the wash rack and oil/water separator in this location. Findings from the SWMU investigation are presented in Appendix H, SM173.

2.5.2.3 Waste Characteristics

No known chemicals/compounds were found during the Environmental Literature Review. However, it is suspected that power source for the Steam Jenny was either gas or diesel engine driven with propane or diesel heat. There may have been contamination due to the gas or diesel fuel used to power the Steam Jenny. Contamination may also result from the wastewater from the vehicles that were washed in this area.

2.5.2.4 Waste Quantity

No records were found during the Environmental Literature Review to document wastes or disposal practices at Building SM173. It is uncertain how the vehicle washing related wastes, were used and disposed of at this structure. It is assumed that the wastewater from the vehicles ran off through the existing wash rack and oil/water separator in this area.



TABLE 2-1

BUILDING HP902 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage
1948	Building Constructed
1948	Ordnance Warehouse Number 3
1950 - 51	Small Arms (Parkerizing) Shop
1962	Administration Building/Small Arms Shop/General Warehouse
1963	Construction Engineer Shop
1967 - c1990	Construction Equipment Maintenance Shop/Weapons Maintenance Shop
January 31, 1985	Plans were drawn to install an Armory in Building 902
1986	Maintenance Facility/Armory
October 16, 2001	Construction/Weight Handling Equipment Shop

Notes:

Parkerizing = Is the process by which guns are coated for protection.

Source:

Dolph, Jim. October 2001. <u>Draft Twenty Potential Sites Environmental Literature Search, Marine Corps Base, Camp Lejeune, North Carolina</u>. Prepared for the Department of the Navy Atlantic Division Naval Facilities Engineering Command, Norfolk Virginia.

TABLE 2-2

BUILDING HP902 KNOWN DISPOSAL PRACTICES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Description
1971 - 1972	Waste oil (including solvents) was reportedly sprayed on unimproved roads on the Base with an 800-
	Gallon Distributor Truck.
1983	Wastewater from vehicle washing discharged onto ground
1989	Waste oil was deposited into an AST, estimated 3100 gallons (mixed with water) generated annually
1989	Paint thinner, disposed of through Defense Reutilization and Marketing Office, estimated 2.5 – 5 gallons annually
1989	Mineral spirits, disposed of through Defense Reutilization and Marketing Office, estimated $2.5-5$ gallons annually
1989	Solvents, disposed of through Safety Kleen and Defense Reutilization and Marketing Office

Source:

Dolph, Jim. October 2001. <u>Draft Twenty Potential Sites Environmental Literature Search, Marine Corps Base, Camp Lejeune, North Carolina</u>. Prepared for the Department of the Navy Atlantic Division Naval Facilities Engineering Command, Norfolk Virginia.

TABLE 2-3

BUILDING HP908 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage
1948	Building Constructed
1948	Electronic Equipment Storage Building
1949	MCSD Electronics Supply Division Storage
1952 – 1963	Central Paint Shop
1963-1965	Tank - Automotive Maintenance Shop / Central Paint Shop
1970	Combat Vehicle Maintenance Facility
2001	Automotive/Vehicle Shop

Source:

Dolph, Jim. October 2001. <u>Draft Twenty Potential Sites Environmental Literature Search, Marine Corps Base, Camp Lejeune, North Carolina</u>. Prepared for the Department of the Navy Atlantic Division Naval Facilities Engineering Command, Norfolk Virginia.

BUILDING HP908 KNOWN DISPOSAL PRACTICES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Description
1976	A Miscellaneous Point Source Survey stated that all wastes were collected from the paint shops, (paint, contaminated wastewater and solvents), and disposed of in the Base Chemical Landfill.
1982	Beginning in 1964 some paint was burned at the Hadnot Point Burn Dump (WAR, April 1993).
1989	Generated 78 gallons of waste dope and lacquer thinner annually – Disposed of through the DRMO.
1989	Generated 40 gallons of Mineral Sprits contaminated with waste paint annually – Disposed of through the DRMO.

Source:

BUILDING HP1120 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage
1956-1976	Automobile Hobby Shop
1976	Hobby Shop Paint Shop
1976 – 1996	Automobile Hobby Shop

Source:

BUILDING HP1120 KNOWN DISPOSAL PRACTICES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Description
1971 - 1972	Waste oil (including solvents) was reportedly sprayed on unimproved roads on the base with an 800-Gallon Distributor Truck.
1972	Waste oil was deposited into a 1000 gallon AST that was pumped out by Base Maintenance.

Source:

BUILDING HP1124 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage
1970	Building Constructed
1970-1997	Automobile Repair Shop (Open Shed Building)
2001	Exchange Service Station

Source:

BUILDING HP1124 KNOWN DISPOSAL PRACTICES PRELIMINARY ASSESMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Description
1996	Waste oil and antifreeze disposed of in a 500 gallon AST

Source:

Baker. November 2001. Revised Final Phase I, SWMU Confirmatory Sampling Report, Marine Corps Base, Camp Lejeune, North Carolina. Prepared for the Department of the Navy, Naval Facilities Engineering Command Atlantic Division, Norfolk Virginia.

BUILDING HP1409 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage	
1944	Storage Building	
1945 - 1949	Upholstery and Carpentry Shop	
1959	Decontamination Building / Storage	
1965-1970	Public Works Maintenance Storage	
1971	Applied Instruction Building	
1972	Training Support Center	
1976	Administrative	
1982	Administrative / Furniture Repair Shop	
1997 – 2001	Boat Shop	

Source:

BUILDING HP1409 KNOWN DISPOSAL PRACTICES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Year	Description
1 1945	Trash was collected Base wide (general refuse) daily and hauled to the incinerators or open burning dumps.
1982	Paint stripper from the Furniture Repair Shop was disposed of in the Fly Ash Dump

Source:

Dolph, Jim. October 2001. <u>Draft Twenty Potential Sites Environmental Literature Search, Marine Corps Base, Camp Lejeune, North Carolina</u>. Prepared for the Department of the Navy Atlantic Division Naval Facilities Engineering Command, Norfolk Virginia.

Water and Air Research (WAR). April, 1983. <u>Initial Assessment Study of Marine Corps Base Camp Lejeune, North Carolina</u>. Marine Corps Base, North Carolina. Prepared for the Naval Energy and Environmental Support Activity.

FORMER BUILDING HP1512 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage
Unknown	Most likely an automotive support structure

Source:

BUILDING TC830 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage
1943	Building Constructed
1943-1949	Storehouse
1965-1974	Academic Instruction Building
1975	Open Storage
1980 – 2000	Laundry / Exchange Dry Cleaning Plant
2001	Storage

Source:

BUILDING TC830 KNOWN DISPOSAL PRACTICES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Description
1 1945	Trash was collected Base wide (general refuse) daily and hauled to the incinerators or open burning dumps.

Source:

BUILDING SAS113 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage
1986	Building Constructed
1986 – 2001	Automobile Hobby Shop

Source:

BUILDING AS116 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage
1954	Constructed
1954 – 1979	Combat Vehicle Maintenance Shop
1979-1981	Hazardous/Flammable Storehouse
1983-1987	Automobile Hobby Shop
1993-	Automobile Hobby Shop / Paint Shop
2001	Auto Hobby / Paint Shop

Source:

BUILDING AS119 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage
1963	Building Constructed
1963 – 1985	Automotive Vehicle Maintenance Facility
2000	Automotive Maintenance Facility

Source:

BUILDING M119 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage
1943	Building Constructed
1943	Gun Shed
1945	Garage
1951-1976	School / Applied Instruction Building
1988	Vehicle Maintenance Shop
1991	Driving School
2001	Automotive Vehicle Maintenance Shop

Source:

BUILDING M119 KNOWN DISPOSAL PRACTICES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Description
1945	Trash was collected base wide (general refuse) daily and hauled to the incinerators or open burning dumps.
1971 - 1972	Waste oil (including solvents) was sprayed on unimproved roads on the base with an 800-Gallon Distributor Truck.
1976	A gasoline spill occurred during a fuel transfer of an UST at Building M119. Approximately 200 gallons of gasoline overflowed into a nearby ditch where it was then cleaned up by Base Maintenance.
1989	Solvent disposed of via Safety Kleen Company
1989	Waste oil from Buildings M119 and M120 was deposited in an underground storage tank, estimated 2045 gallons annually.

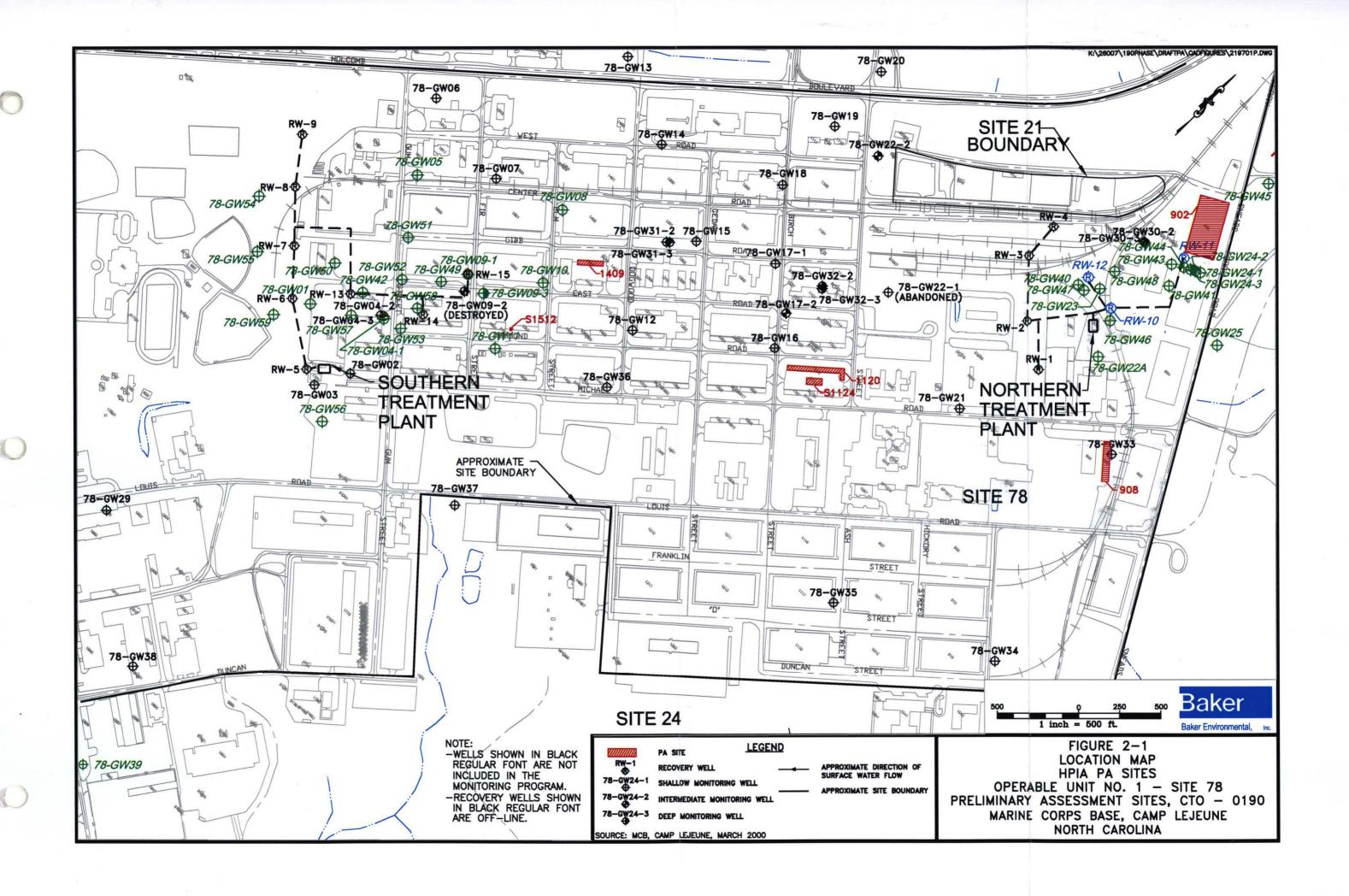
Source:

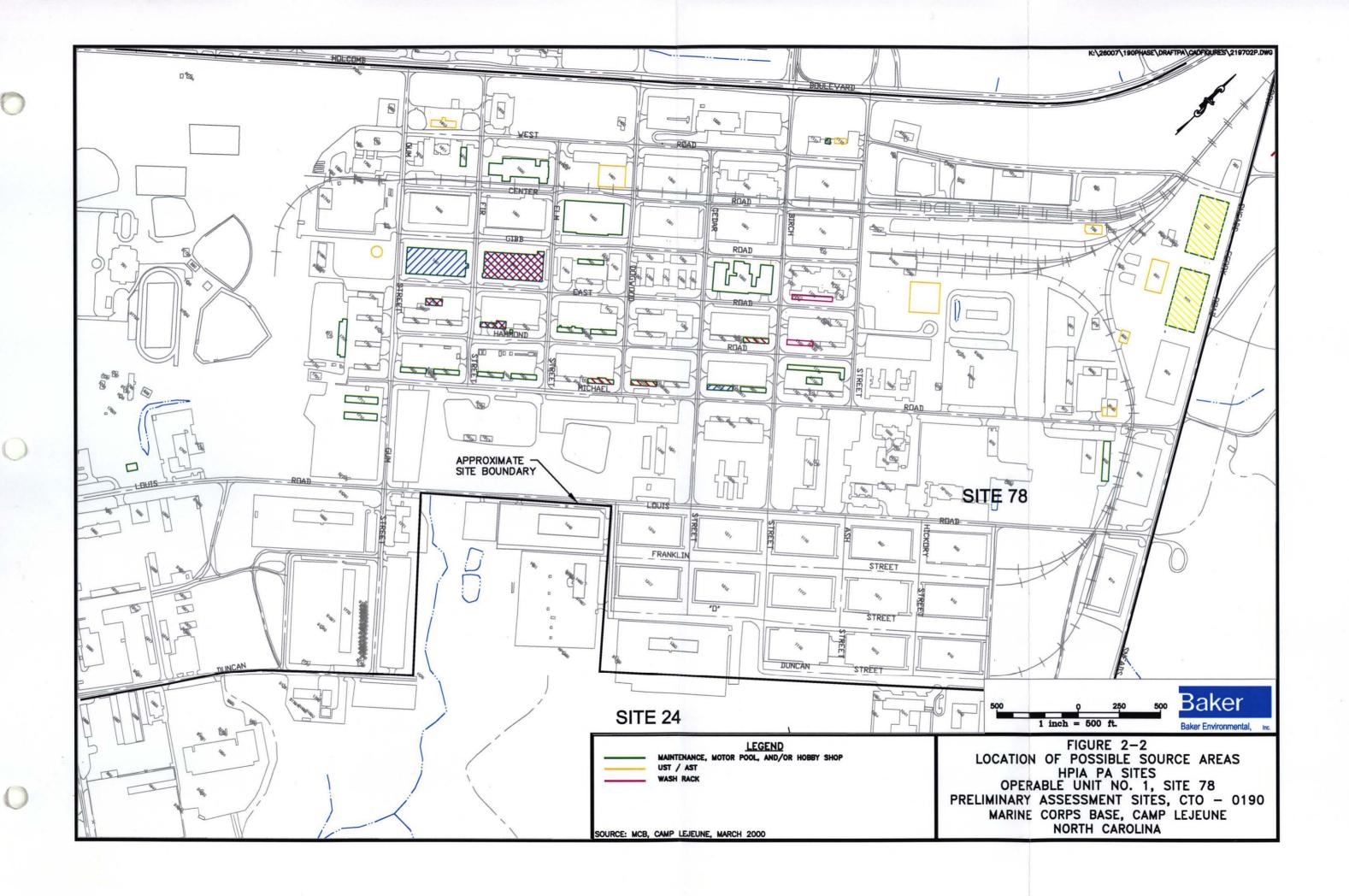
BUILDING SM173 HISTORY OF USE PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Date	Usage	
1962	Building Constructed	
1962	Used to House a Steam Generator]

Source:









K/26007/190PHASE/DRAFTPA/CADFIGURES/SITE78AERIALS (AERIAL 1)

Baker

FIGURE 2-3 HISTORICAL AERIAL PHOTO 1956 HPIA PA SITES

OPERABLE UNIT NO. 1 - SITE 78
PRELIMINARY ASSESSMENT SITES, CTO - 0190
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



K/26007/190PHASE/DRAFTPA/CADFIGURES/SITE78AERIALS (AERIAL 2)

Baker

FIGURE 2-4 HISTORICAL AERIAL PHOTO 1964 HPIA PA SITES

OPERABLE UNIT NO. 1 - SITE 78
PRELIMINARY ASSESSMENT SITES, CTO - 0190
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



K/26007/190PHASE/DRAFTPA/CADFIGURES/SITE78AERIALS (AERIAL 3)

Baker

FIGURE 2-5 HISTORICAL AERIAL PHOTO 1984 HPIA PA SITES

OPERABLE UNIT NO. 1 - SITE 78
PRELIMINARY ASSESSMENT SITES, CTO - 0190
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

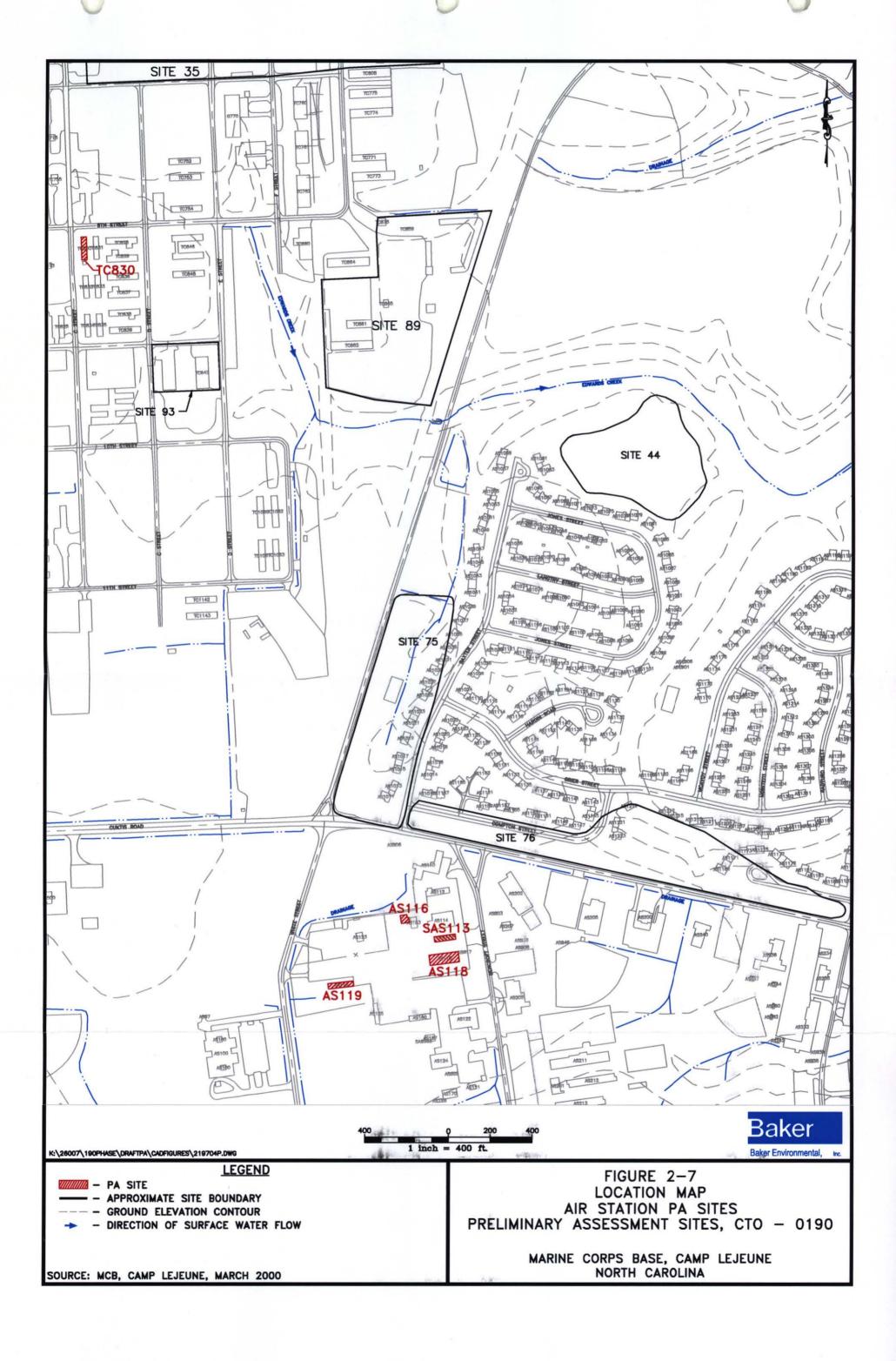


K/26007/190PHASE/DRAFTPA/CADFIGURES/SITE78AERIALS (AERIAL 4)

Baker

FIGURE 2-6 HISTORICAL AERIAL PHOTO 1996 HPIA PA SITES

OPERABLE UNIT NO. 1 - SITE 78
PRELIMINARY ASSESSMENT SITES, CTO - 0190
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA





K:\26007\190PHASE\DRAFTPA\CADFIGURES\219705P.DWG

//////// - PA SITE

LEGEND

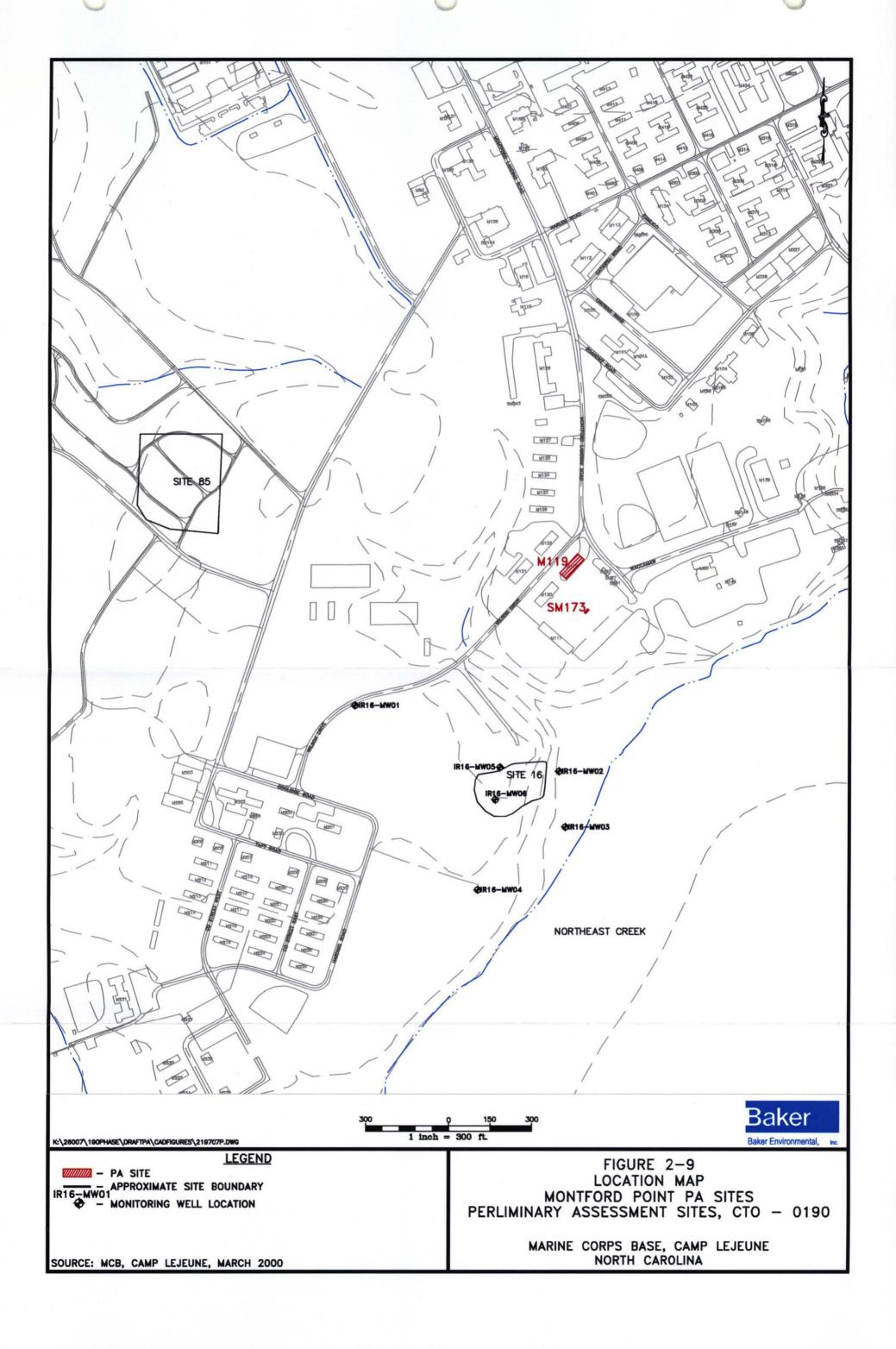
- - APPROXIMATE SITE BOUNDARY - - GROUND ELEVATION CONTOUR

- DIRECTION OF SURFACE WATER FLOW

SOURCE: MCB, CAMP LEJEUNE, MARCH 2000 AERIAL PHOTOGRAPH WAS TAKEN 1996

FIGURE 2-8 AERIAL PHOTOGRAPH AIR STATION PA SITES
PRELIMINARY ASSESSMENT SITES, CTO - 0190

> MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA





3.0 PATHWAY AND ENVIRONMENTAL HAZARD ASSESSMENT

This section provides the potential impact of each site, if any, on the surrounding human population and nearby environment. Four pathways were assessed; groundwater, surface water, soil, and air. The qualitative evaluation of the pathways addresses:

- The groundwater pathway evaluates the migration of hazardous substances to, and within, an aquifer and evaluates the potential impacts to drinking water supplies. The CERCLA recommended target distance limit for the groundwater pathway is a 4 mile radius around the site, however, for this PA/SI Report a 2- mile radius was evaluated.
- The surface water pathway focuses on the migration of hazardous substances to surface water bodies. It assesses the potential impacts to drinking water supplies, the human food chain, and sensitive environments. The CERCLA recommended target distance limit for the surface water pathway is 15 miles downstream from the probable point of entry to surface water, however, for this PA/SI Report a 5-mile downstream probable point of entry was evaluated.
- The soil exposure pathway evaluates the potential threat to people on or near the site who may come into contact with exposed wastes or areas of suspected contamination. This includes both soil ingestion and dermal exposure. The target distance limit for the soil exposure varies between resident population impact and nearby population impact. The target distance limit for the resident population impact is 200 feet, where the target distance limit for the nearby population impact is one mile.
- The air pathway assesses the migration of hazardous substances, in gaseous or particulate form, through air. The primary impacts are to people and sensitive environments. The CERCLA recommended target distance limit for the air pathway is the same 4 mile radius around the site as the groundwater pathway, however for this PA/SI Report a 1 mile radius was evaluated.

Ultimately, the CERCLA PA process is designed to differentiate the sites that pose little or no potential impact to human health and the environmental receptors from sites that warrant further investigation.

The following subsections describe the present regional and local climate, topography, soil associations, surface hydrology and drainage, water supplies, geology, hydrogeology, natural resources and ecological features for MCB Camp Lejeune. These environmental characteristics will provide pertinent background information for qualitatively evaluating the sites. Discussions for each pathway are general unless site-specific information is available. The tables and figures for Section 3.0 are presented at the end of the section.

3.1 Regional Environmental Setting

This section presents a discussion of the physical characteristics of MCB Camp Lejeune. The discussion details the topography and surface features, hydrology, geology, hydrogeology, land usage, climatology, water supply, ecology, wetlands, and threatened and endangered species. This information was obtained from the available literature about MCB Camp Lejeune.

3.1.1 Climatology

Although coastal North Carolina lacks distinct wet and dry seasons, there is some seasonal variation in average precipitation. July receives the most precipitation and rainfall amounts during summer are generally the greatest. Daily showers during the summer are common, and so are periods of one or two weeks without rain. Convective showers and thunderstorms also contribute to the variability of precipitation during the summer months. October receives the least amount of precipitation, on average. Throughout the winter and spring months precipitation occurs primarily as migratory low pressure storms. MCB Camp Lejeune's average yearly rainfall is approximately 52 inches. Table 3-1 presents a climatic summary of data collected during 35 years (January 1955 to December 1990) of observations at MCAS New River.

MCB Camp Lejeune experiences hot and humid summers, however, ocean breezes frequently produce cooling effects. The winter months are mild, with occasional brief cold spells. Average daily temperatures range from 38°F to 58°F in January and 72°F to 86°F in July. The average relative humidity, between 75 and 85 percent, does not vary greatly from season to season.

3.1.2 Topography and Surface Features

The generally flat topography of MCB Camp Lejeune is typical of the North Carolina Coastal Plain. Elevations on the Base vary from sea level to 72 feet above mean sea level (msl); however, the elevation of most of MCB Camp Lejeune is between 20 and 40 feet msl.

Drainage at Camp Lejeune is generally toward the New River, except in areas near the coast that drain through the Intracoastal Waterway. In developed areas, natural drainage has been altered by asphalt cover, storm sewers, and drainage ditches. Approximately 70 percent of Camp Lejeune is in broad, flat interstream areas. Drainage is poor in these areas and the soils are often wet (WAR, 1983). The U.S. Army, Corps of Engineers has mapped the limits of 100-year floodplain at Camp Lejeune at 7.0 feet above msl in the upper reaches of the New River increasing downstream to 11 feet above msl near the coastal area (WAR, 1983).

3.1.3 Surface Soil Associations

The soil survey report for MCB Camp Lejeune was prepared by the Soil Conservation Service (SCS) in 1984. Since that time, an updated report for Onslow County was issued by the SCS in 1992. Information provided in this section was obtained from these two reports.

Figure 3-1 shows the general soil associations in Onslow County, which includes MCB Camp Lejeune. A soil association is a landscape that exhibits a distinctive pattern based on soils, drainage and relief. These associations consist of one or more major soil types and at least one minor soil type. The association is then named for the major soil(s). A soil type from one association can exist in other associations, but commonly in a different pattern or percentage.

The two terms, loam and muck, are specifically used to describe soils. A loam is a soil that contains less than 52 percent sand, 28 to 50 percent silt, and 7 to 27 percent clay. A muck is a dark, finely layered, well decomposed soil that contains organic plant material.

Six soil associations occur at MCB Camp Lejeune. The Baymeade-Foreston-Stallings soil association is the most widely distributed soil group at the Base. The other soil associations that are present are the Leon-Murville-Kureb, Muckalee-Dorovan, Wando-Pactolus, Norfolk-Goldsboro-Onslow and Bohicket-Newman. Two other soil associations occur in Onslow County but, not present at MCB Camp Lejeune (Croatan and Rains-Woodington-Torhunta Associations);

however, individual soil types from these last two associations are found at MCB Camp Lejeune. Detailed information on the specific associations are provided in Appendix B of the Background Study Report for Camp Lejeune (Baker, April 2001).

3.1.4 Subsurface Geology

MCB Camp Lejeune is within the Tidewater region of the Atlantic Coastal Plain physiographic province. The sediments of the Atlantic Coastal Plain consist mostly of interbedded sands, silts, clays, calcareous clays, shell beds, sandstone and limestone. These sediments are layered in interfingering beds and lenses that gently dip and thicken to the southeast to a combined thickness of approximately 1,500 feet. They were deposited in marine or near-shore environments and range in age from early Cretaceous to Quaternary time. Regionally, the sediments comprise 10 aquifers and nine confining units that overlie igneous and metamorphic basement rocks of the pre-Cretaceous age.

Seven of these aquifers and their associated confining units are present in the MCB Camp Lejeune area (Cardinell, et al., 1993). Table 3-2 presents a generalized stratigraphic column for Jones and Onslow Counties, North Carolina. Hydrogeologic section location plan and hydrogeologic cross-sections of the MCB Camp Lejeune area are presented in the Hydrogeologic Framework of U.S. Marine Corps Base at Camp Lejeune, North Carolina (Cardinell, et al, 1993). The following paragraphs provide a description of the lithology of the surficial, Castle Hayne, Beaufort, and Peedee aquifers as presented in Cardinell et al. 1993.

The surficial aquifer consists of interfingering beds of sand, clay, sandy clay, and silt of Quarternary and Miocene age that contain some peat and shells. The sand beds that make up the surficial aquifer are part of the Belgrade Formation (Table 3-2). The clay, sandy clay, and silt beds observed within the surficial aquifer are thin and discontinuous, and have limited lateral continuity. The general lithology of the surficial aquifer and the absence of any thick, continuous clay beds are indications of good vertical conductivity within the aquifer.

The confining unit for the Castle Hayne aquifer is composed of clay, silt, and sandy clay beds. These beds form a unit across the Base that may be represented by one or more geological units such as the Quaternary or Miocene deposits at the bottom of the surficial aquifer, the uppermost beds of the River Bend Formation or the uppermost beds of the Castle Hayne Formation. In general, the Castle Hayne confining unit at MCB Camp Lejeune may be described as a group of

less permeable beds at the top of the Castle Hayne aquifer that have been partly eroded. This confining unit may only be partly effective in retarding the vertical movement of groundwater between the surficial and Castle Hayne aquifers.

The Castle Hayne aquifer consists of soils from the Castle Hayne Formation of Eocene age and some lower beds of the River Bend Formation of Oligocene age. This aquifer primarily consists of sand, shell rock, and limestone beds. The upper part of the aquifer consists primarily of calcareous sand with some continuous and discontinuous thin clay and silt beds (generally 10 to 15 feet thick). The calcareous sand becomes more limey with depth. The lower part of the aquifer primarily consists of consolidated or poorly consolidated limestone and sandy limestone interbedded with clay and sand.

The Beaufort confining unit overlies the Beaufort aquifer and consists of clay, silt, and sandy clay or the uppermost sediments of the Beaufort Formation and the lowermost clay and silt beds of the overlying Castle Hayne Formation. The general silty character of this confining unit is very similar to the Castle Hayne confining unit. Although the deeper unit is slightly thicker and is not known to be discontinuous, it also is likely to be only partly effective in retarding the vertical exchange of groundwater between the Beaufort and Castle Hayne aquifers.

The Beaufort aquifer underlies the Beaufort confining unit and the Castle Hayne aquifer and is composed of Paleocene aged soils. These deposits consist of fine to medium glauconitic sand, clayey sand, and clay beds of marine origin, with a few thin (3 to 6 feet) shell and limestone beds. As with other hydrogeologic units, the Beaufort aquifer is not necessarily restricted to a single formation and may include permeable beds of older Cretaceous formations that are in hydraulic connection with the aquifer.

The confining unit for the Peedee aquifer is composed of clay, silt, and sandy clay beds that form the uppermost units of the Peedee Formation. In some places, the confining unit may also include the lowermost beds of the Beaufort Formation.

The Peedee aquifer underlies the Peedee confining unit and the Beaufort aquifer. It is composed primarily of sand of the Peedee Formation (Cretaceous age). A few thin beds of calcareous sandstone, limestone, clay and silt are interlayered with the sand within the Peedee Formation.

The Black Creek confining unit, which underlies the Pedee aquifer, is composed of clay, silty clay and sandy-clay beds. The confining unit's beds belong to the lowermost Pedee Formation and uppermost Black Creek Formation.

The Black Creek aquifer, primarily composed of units from the Black Creek Formation, is formed from thinly-laminated clays interlayered with sands, clean sands and clays and layers including lignitized wood. This aquifer occurs throughout the MCB Camp Lejeune area, but contains saltwater.

The Black Creek aquifer is underlain by the Upper Cape Fear confining unit and the Upper Cape Fear aquifer. The Upper Cape Fear confining unit is composed of clay and silt beds with local thin sand lenses from layers belonging to the lower Black Creek Formation and the Upper Cape Fear Formation.

The Upper Cape Fear aquifer is present throughout the MCB Camp Lejeune area and also contains saltwater. The Upper Cape Fear aquifer is composed of 3 to 5 foot layers of sand and clay. The sands in the aquifer range from fine to course with some gravel.

Below the Upper Cape Fear lies the Lower Cape Fear confining unit and the Lower Cape Fear aquifer. The Lower Cape Fear confining unit is beds of silt and clay from the Cape Fear Formation. However, the Upper and Lower Cape Fear aquifers are defined by a difference in head pressure and chloride content. The Lower Cape Fear confining unit may not completely separate these two aquifers.

The lower Cape Fear aquifer contains saltwater and underlies the entire MCB Camp Lejeune area. The sediments that form the lower Cape Fear aquifer are similar to those in the upper Cape Fear but include thin limestone beds.

3.1.5 Hydrogeology

The following paragraphs discuss the hydrogeologic conditions at MCB Camp Lejeune. The information presented within this section is from literature published by the United States Geological Survey (USGS) (Harned, et al., 1989 and Cardinell, et al., 1993). Additionally, information was collected from a technical memorandum prepared by Baker summarizing groundwater data and aquifer characteristics for MCB Camp Lejeune (provided as Appendix J). Table 3-3 provides a summary of estimated hydraulic properties for the Castle Hayne aquifer.

USGS studies at MCB Camp Lejeune indicate that the area is underlain by sand and limestone aquifers separated by confining units of silt and clay. These aquifers include the surficial (water table), Castle Hayne, Beaufort, Peedee, Black Creek, and upper and lower Cape Fear. Less permeable clay and silt beds function as confining units or semi-confining units that separate the aquifers and impede the flow of groundwater between aquifers.

The surficial unit consists of interfingering beds of sand, clay, sandy clay and silt that contain some peat and shells of Quaternary and Miocene age. These sediments commonly extend to depths of 50 to 100 feet below ground surface (bgs). Thickness of the surficial aquifer in the MCB Camp Lejeune area ranges from zero to 73 feet, and typically average 25 feet (Cardinell, et al., 1993). The aquifer is generally thickest in the interstream divide areas and may be absent where it is cut by the New River and its tributaries. The clay, sandy clay, and silt beds that occur in the surficial aquifer are thin and discontinuous throughout. A semi-confining unit is found in the surficial aquifer within some portions of MCB Camp Lejeune.

Recharge to the surficial aquifer is by rainfall. The aquifer receives more recharge in the winter than in the summer when much of the water evaporates or is transpired by plants before it can reach the water table. Most of the surficial groundwater is discharged to local streams, but some water passes through the underlying semiconfining unit. Recharge for the surficial aquifer is based on an average rainfall of 52 inches per year and an average recharge of 30 percent, or an annual recharge of approximately 16 inches per year. The remaining 70 percent of the rainfall is lost as surface runoff or evapotranspiration. Sixteen inches of recharge equates to 7,600,000 gallons per day (gpd) per square mile or approximately 114,000,000 gpd for all of MCB Camp Lejeune (based on 150 square miles of recharge area). Water levels in the wells tapping the surficial aquifer vary seasonally. The water table is generally highest in the winter and spring, and lowest in the summer and early fall. The lateral hydraulic conductivity for the surficial aquifer was estimated by the USGS at 50 feet per day (ft/day) based on a general soil composition of fine sand mixed with some silt and clay (Cardinal, et al., 1993).

A study of data from aquifer tests (pump tests) done at MCB Camp Lejeune was conducted by Baker in 1994 to evaluate aquifer characteristics and production capacities (Appendix J). The information contained in this memorandum pertains primarily to the surficial aquifer. Based on information available at the time the memorandum was written, the average pumping rates for the surficial aquifer are from 0.5 to three gallons per minute (gpm); transmissivity ranges from 7.1 to 7,100 square feet per day (ft^2/day); storativity ranged from 1.5 x 10^3 to 7.5 x 10^2 ; and hydraulic

conductivity ranges from approximately 0.5 to 1.4 ft/day. These data indicate that the estimated lateral hydraulic conductivity reported by USGS may be higher than actual conditions in the vicinity of MCB Camp Lejeune.

Although the aquifer is classified as GA (i.e., existing or a potential source of drinking water supply for humans), it is not used as a potable water source at MCB Camp Lejeune. The primary reason for it's non-use is because of its low yielding production rates which are typically less than three gpm.

The principal water supply aquifer for MCB Camp Lejeune is the Castle Hayne aquifer. This aquifer primarily resides within the River Bend Formation, which consists of sand, cemented shells and limestone. Buried paleostream channels containing various deposits exist within the aquifer. The top of the aquifer ranges from 10 feet above msl to 70 feet below msl and is irregular over most of the northern portion of MCB Camp Lejeune. The aquifer is more regular in areas southeast of the New River, where it slopes southeastward. The Castle Hayne thickens to the east, from 160 feet in the Camp Geiger area to more than 400 feet at the eastern boundary of MCB Camp Lejeune.

The vertical hydraulic conductivity of the Castle Hayne confining unit was estimated to range from 0.0014 to 0.41 ft/d. These values are comparable to those determined for silts and clays; therefore, this unit may only be partly effective at retarding the vertical movement of groundwater between the surficial and Castle Hayne aquifers (Cardinell, et al., 1993).

Estimated transmissivity, hydraulic conductivity and storage coefficient values (unitless) for the Castle Hayne aquifer range from 6,100 to 183,300 gpd/ft, 14 to 91 ft/d and 2 x 10⁻⁴ to 1.9 x 10⁻³, respectively. An aquifer pump test conducted by ESE (1990) in the HPIA, using an existing water supply well (HP642), indicates an average transmissivity and storage coefficient of 9,600 gpd/ft and 8.8 x 10⁻⁴, respectively (ESE, 1990). Table 3-3 summarizes the previously stated information.

Recharge of the Castle Hayne aquifer at MCB Camp Lejeune is primarily received from the surficial aquifer. Natural discharge is to the New River and its major tributaries. The Castle Hayne aquifer provides roughly seven million gallons of water to MCB Camp Lejeune. Groundwater pumping has not significantly affected natural head gradients in the aquifer.

MCB Camp Lejeune lies in an area where the upper part of the Castle Hayne aquifer contains freshwater. Saltwater is found in the bottom of the aquifer in the region and in the New River estuary; both are of concern in managing water withdrawals from the aquifer. Over pumping the deeper parts of the aquifer or in areas hydraulically connected to estuarine streams could cause saltwater intrusions. The aquifer underlying most of the area contains water having less than 120 milligrams per liter (mg/L) of chloride.

3.1.6 Water Supply

Potable water for MCB Camp Lejeune is supplied entirely by groundwater. Groundwater usage is roughly eight million gpd (Cardinell, et al., 1993). Groundwater is pumped from approximately 79 water supply wells located within the boundaries of MCB Camp Lejeune (Table 3-6). According to Base personnel, groundwater is treated at five plants located at Hadnot Point, Holcomb Boulevard, MCAS New River, Courthouse Bay, and Onslow Beach having a total capacity of 15.8 million gpd.

All of the water supply wells use the Castle Hayne aquifer. The Castle Hayne aquifer is a highly permeable, semi-confined aquifer that can yield several hundred to 1,000 gpm in municipal and industrial wells in the MCB Camp Lejeune area. The water supply wells at the Base average 162 feet in depth; eight inches in diameter (casing); and yield 174 gpm (Harned, et al., 1989). The water is typically a hard, calcium bicarbonate type. Information concerning the supply wells was gathered from the Wellhead Management Program Engineering Study 91-36 (Geophex, 1991), the Preliminary Draft Report Wellhead Monitoring Study 92-34 (Greenhorne and O'Mara, Inc., 1992), and interviews with Base personnel.

3.1.7 Surface Water Hydrology

The dominant surface water body at MCB Camp Lejeune is the New River which receives drainage from most of the Base. The river is short, with a course of approximately 50 miles on the central Coastal Plain of North Carolina. Over most of its course, the New River is confined to a narrow channel entrenched in Eocene and Oligocene limestones. South of Jacksonville, the river widens as it flows across less resistant sands, clays, and marls. At MCB Camp Lejeune, the New River flows in a southerly direction into the Atlantic Ocean through the New River Inlet. Several small coastal creeks that are not associated with the New River or its tributaries drain into the area of MCB Camp Lejeune. The New River, the Intracoastal Waterway, and the Atlantic Ocean converge at the New River Inlet (WAR, 1983).

Classifications for surface waters in North Carolina have been published under Title 15 of the North Carolina Administration Code. At MCB Camp Lejeune, the New River falls into three classifications. The portion of the river that passes from the Seaboard Coast Line railroad trestle (located south/southwest of where U.S. Route 17/North Carolina Route 24 crosses the New River) to Montford Point is classified as SC NSW HQW. This classification is defined as salt waters protected for secondary recreation, fishing, aquatic life including propagation and survival (SC) that are nutrient sensitive (NSW) and of high quality (HQW). The portion of the river that resides between Montford Point to a line extending across the river from Grey Point to a point of land approximately 2,200 yards downstream of the mouth of Duck Creek is classified as Class SC NSW. As previously described, these waters are similar to the waters upstream of Montford Point, however they are not considered high quality waters. The remaining portion of the New River is classified as estuarine water suited for commercial shell fishing and all other tidal saltwater uses (SA).

3.1.8 Ecological Characteristics

The Natural Resources and Environmental Affairs (NREA) Division of MCB Camp Lejeune, the U.S. Fish and Wildlife Service, and the North Carolina Wildlife Resource Commission have entered into an agreement for the protection of endangered and threatened species that might inhabit MCB Camp Lejeune. Habitats are maintained at MCB Camp Lejeune for the preservation and protection of rare and endangered species through the Base's forest and wildlife management programs. Full protection is provided to such species, and critical habitat is designated in management plans to prevent or mitigate adverse effects of Base activities. Special emphasis is placed on habitat and sightings of alligators, osprey, bald eagles, cougars, dusky seaside sparrows, and red-cockaded woodpeckers (WAR, 1983).

Camp Lejeune covers approximately 236 square miles, 84 percent of which is forested (USMC, 1987). Approximately 45 percent of this is pine forest, 22 percent is mixed pine/hardwood forest, and 17 percent is hardwood forest. Nine percent of the Base, a total of 3,587 acres, is wetland and includes pure pond pine stands, mixed pond pine/hardwood stands, marshes, pocosins, and wooded swamps. The Base also contains 80 miles of tidal streams, 21 miles of marine shoreline, and 12 freshwater ponds. Over half of the 153,000 acres located within the boundaries of MCB Camp Lejeune are under forestry management. Timber producing areas are under even-aged management with the exception of those areas along streams and swamps. These areas are managed to provide both wildlife habitat and erosion control. Forest management provides wood

production, increased wildlife populations, enhancement of natural beauty, soil protection, prevention of stream pollution, and protection of endangered species (WAR, 1983).

Because of the natural resources on the Base, forested areas are actively managed for timber. Game species are also managed for hunting, and ponds are maintained for fishing. Game species managed include wild turkey, white-tailed deer, black bear, grey and fox squirrels, bobwhite quail, eastern cottontail and marsh rabbits, raccoons, and wood ducks.

Aquatic ecosystems on MCB Camp Lejeune consist of small lakes, the New River estuary, numerous tributaries, creeks, and part of the Intracoastal Waterway. A wide variety of freshwater and saltwater fish species exist there. Freshwater ponds are under management to produce optimum yields and ensure continued harvest of desirable fish species (WAR, 1983). Freshwater fish in the streams and ponds include largemouth bass, redbreast sunfish, bluegill, chain pickerel, yellow perch, and catfish. Reptiles include alligators, turtles, and snakes (including venomous species). Both recreational and commercial fishing are practiced in the waterways of the New River and its tributaries (WAR, 1983).

Many natural communities are present in the coastal plain. Subcommunities and variations of these major community types are also present and alterations of natural communities have occurred in response to disturbance and intervention (i.e., forest cleared to become pasture). The natural communities found in the Camp Lejeune area are summarized as follows:

- Loblolly Pine Forest a dominant forest type at Camp Lejeune. Pine forest often has a
 dense hardwood subcanopy and shrub understory because of clear-cutting and/or fire
 suppression. Dense shading results in a sparse ground layer of vegetation with little
 probability of rare species occurring (LeBlond et. al., 1994).
- Hardwood Forest Found primarily in stream floodplains and on slopes and terraces next
 to stream valleys and estuarine features. Stream floodplain communities include cypress gum swamp and coastal plain small stream swamp. Very few rare species are found in
 hardwood forests, but the communities themselves can be quite rare (LeBlond
 et. al., 1994).

- Loblolly Pine/Hardwoods Community The predominant forest type at Camp Lejeune. Second growth forest that includes loblolly pine with a mix of hardwoods oak, hickory, sweetgum, sour gum, red maple, and holly (oak is the predominant hardwood). These forests have a low probability for rare species because of the lack of herbaceous development and overall plant diversity (LeBlond et. al., 1994).
- Longleaf Pine Forest and Longleaf Pine/Hardwood Forests Contain critical, fire maintained natural communities: Pine Savanna, Wet Pine Flatwoods, Mesic Pine Flatwoods, Pine/Scrub Oak Sanhill, and Zeric Sanhill Scrub. Some longleaf pine forests have developed in old fields and cut-over areas. The pine savannas and wet pine flatwood communities are particularly important habitats for several rare species (LeBlond et. al., 1994).
- Maritime Forest Develop on the lee side of stable sands and dunes protected from the
 ocean. Live oak is an indicator species with pine, cedar, yaupon, holly, and laurel oak.
 Deciduous hardwoods may be present where forest is mature (USMC, 1987).
- Pond Pine Forest These forests are primarily found in pocosins and are classified by Schafale and Wealkey (1990) as the Pond Pine Woodland natural community. Red bay, sweet bay, and loblolly bay are important components of this community. These forests frequently produce areas of high plant diversity and support several rare species. The Federal endangered loosestrife (*Lysimachia asperulifolia*) is found in this community (LeBlond et. al., 1994).
- Freshwater Marsh Occurs upstream from tidal marshes and downstream from non-tidal freshwater wetlands. Cattails, sedges, and rushes are present. On the coast of North Carolina, swamps are more common than marshes (USMC, 1987).
- Salt Marsh These areas occur in saline tidal areas protected from tidal action by barrier beach features. The barrier islands fronting the Atlantic Ocean support Brackish Marsh, Upper Beach, Dune Grass, and Maritime Wet and Dry Grassland communities. Regularly flooded, tidally influenced areas dominated by salt-tolerant grasses. Saltwater cordgrass is a characteristic species. Tidal mud flats may be present during low tide. These dynamic communities are critical to such Federal endangered species as the piping plover

(Charadrius melodus) and the Federal threatened American loggerhead turtle (Caretta caretta) and the green turtle (Chelonia mydas) (LeBlond et. al., 1994).

- Salt Shrub Thicket High areas of salt marshes and beach areas behind dunes. Subjected to salt spray and periodic saltwater flooding. Dominated by salt resistant shrubs.
- Dunes/Beaches Zones from the ocean shore to the maritime forest. Subjected to sand, salt, wind, and water.
- Ponds and Lakes Low depressional areas where water table reaches the surface or where
 ground is impermeable. In ponds rooted plants can grow across the bottom, Fish
 populations managed in these ponds include redear, bluegill, largemouth bass, and
 channel catfish (USMC, 1987).
- Open Water Marine and estuarine water and all underlying bottoms below the intertidal zone.

3.1.9 Wetlands

The NC DENR's Division of Environmental Management (DEM) has developed guidance concerning activities that may impact wetlands (NC DENR, 1992). In addition, certain activities affecting wetlands also are regulated by the U.S. Army Corps of Engineers. The U.S. Fish and Wildlife Service has prepared National Wetland Inventory (NWI) maps for the Camp Lejeune, North Carolina area by stereoscopic analysis of high altitude aerial photographs (USDI, 1982). Figures 3-5, 3-7, and 3-13 present the biohabitation map from the Site 78 RI (Baker, June 1994) for the HPIA and the NWI map for the Air Station, and Montford Point areas, respectively.

Wetland ecosystems at MCB Camp Lejeune can be categorized into five habitat types: (1) pond pine or pocosin; (2) sweet gum, water oak, cypress, and tupelo; (3) sweet bay, swamp black gum, and red maple; (4) tidal marshes; and, (5) coastal beaches. Pocosins provide excellent habitat for bear and deer because these areas are seldom disturbed by humans. The presence of pocosin-type habitat at MCB Camp Lejeune is primarily responsible for the continued existence of black bear in the area. Many of the pocosins are overgrown with brush and pine species that would not be profitable to harvest (WAR, 1983).

Sweet gum, water oak, cypress, and tupelo habitat is found in the rich, moist bottomlands along streams and rivers. This habitat extends to the marine shorelines. Deer, bear, turkey, and waterfowl are commonly found in this type of habitat (WAR, 1983).

Sweet bay, swamp black gum, and red maple habitat exist in the floodplain areas of MCB Camp Lejeune. Fauna including waterfowl, mink, otter, raccoon, deer, bear, and gray squirrel frequent this habitat (WAR, 1983).

The tidal marsh at the mouth of the New River is one of the few remaining North Carolina coastal areas relatively free from filling or other manmade changes. This habitat, which consists of marsh and aquatic plants such as algae, cattails, saltgrass, cordgrass, bulrush, and spikerush, provides wildlife with food and cover. Migratory waterfowl, alligators, raccoons, and river otter exist in this habitat (WAR, 1983).

Coastal beaches along the Intracoastal Waterway and along the outer banks of MCB Camp Lejeune are used for recreation and to house a small military command unit. Basic assault training maneuvers are also conducted along these beaches. Training regulations presently restrict activities that would impact ecologically sensitive coastal barrier dunes. The coastal beaches provides habitat for many shorebirds (WAR, 1983).

3.1.10 Threatened and Endangered Species

Certain species have been granted protection by the U.S. Fish and Wildlife Services under the Federal Endangered Species Act (16 United States Code (U.S.C.) 1531-1543), and/or by the North Carolina Wildlife Resources Commission, under the North Carolina Endangered Species Act (G.S. 113-331 to 113-337). The protected species fall into one of the following status classifications: Federal or state endangered, threatened, or candidate species; state special concern; state significantly rare; or state watch list. While only the Federal or state threatened or endangered and state special concern species are protected from certain actions, the other classified species have the potential for protection in the future.

Surveys have been conducted to identify threatened or endangered species at Camp Lejeune and several programs are underway to manage and protect them. Table 3-4 lists protected species present at the Base and their protected classifications. Of these species, the red-cockaded woodpecker, American alligator, and sea turtle are covered by specific protection programs.

The red-cockaded woodpecker is classified as state endangered. This species requires a specific habitat in mature, living longleaf or loblolly pine trees. The birds exist in family groups and young are raised cooperatively. At Camp Lejeune, 2,512 acres of habitat have been identified and marked for protection. Research on the bird at Camp Lejeune began in 1985 and information has been collected to determine home ranges, population size and composition, reproductive success, and habitat use. An annual roost survey is conducted and 36 colonies of birds have been located.

The American alligator is considered threatened in the northernmost part of its range, which includes North Carolina. The alligator is found in freshwater, estuarine, and saltwater wetlands in Camp Lejeune. Base wetlands are maintained and protected for the alligator. Signs have been erected where alligators are known to live. Annual surveys of Wallace, Southwest, French, Duck, Mill, and Stone Creeks have been conducted since 1977 to identify alligators and their habitats on Base.

Two protected sea turtles, the Atlantic loggerhead and Atlantic green turtle, nest on Onslow Beach at Camp Lejeune and are both classified as threatened species. The green turtle was found nesting in 1980; the sighting was the first time the species was observed nesting north of Georgia. The turtle returned to nest in 1985. Turtle nests on the beach are surveyed and protected, turtles are tagged, and annual turtle status reports are issued.

Four bird species (black skimmer, piping plover, Bachman's sparrow, and peregrine falcon) have also been identified during surveys at Camp Lejeune. The piping plover and peregrine falcon are classified as threatened species. The black skimmer and Bachman's sparrow are classified as special concern (state). The black skimmer and piping plover are sea and shore birds respectively. Skimmers nest on low sandy islands and sand bars along the coast and piping plovers prefer beaches with broad open sandy flats above the high tide line. Skimmers feed above open water and piping plovers feed along the edge of incoming waves. Like the black skimmer and piping plover, Bachman's sparrows are very specific in their habitat requirements. They live in open stretches of pines with grasses and scattered shrubs for ground cover. Bachman's sparrows were observed at numerous locations throughout the southern portion of Camp Lejeune.

In addition to the protected species that breed or forage at Camp Lejeune, several protected whales migrate through the coastal waters off the base during the spring and fall. These include the Atlantic right whale, finback whale, sea whale, and sperm whale. Before artillery or bombing practice is conducted in the area, aerial surveys are made to assure that whales are not present in the impact areas.

A natural heritage resources survey was conducted at Camp Lejeune (LeBlond, 1991) to identify threatened or endangered plants and areas of significant natural interest. From this survey, the rough-leaf loosestrife was the only specie identified that is both Federal and state endangered. Also, several state endangered/threatened and Federal and state candidate species were found on the Base.

3.1.11 Population Distribution

Land Use Demographics

MCB Camp Lejeune presently covers approximately 236 square miles. The Base's population of active and retired military, dependants, and civilian employees is in excess of 142,000. This includes a military population of approximately 40,000 and about 8,000 members of the organized Marine Corps Reserve who train at Camp Lejeune each year. Additionally, the Base employs 4,800 civilians in both appropriated and non-appropriated funded activities. Military dependants living on and off Base number about 56,000 and there is an estimated 41,000 retired military and their dependants living in the area.

The existing land use pattern for the various developed geographic areas within the MCB are listed, per geographic area, on Table 3-5. In addition, the number of acres comprising each land use category has been estimated and provided on the table. Site 16 and Buildings M119 and SM172 are located in the northern region of MCB Camp Lejeune in Montford Point (Camp Johnson).

3.2 Hadnot Point Industrial Area

This section describes the physical setting, topography, drainage characteristics, geology, hydrogeology, and ecological features of Site 78. Information provided in this section is based on previous investigations at Site 78, mainly the Site 78 RI (Baker, June 1994) and on the PA field reconnaissance.

3.2.1 Local Environmental Setting

3.2.1.1 Site Topography and Surface Features

OU No. 1 is dominantly a flat area with surface elevations between 5 and 30 ft above msl. As depicted on Figure 3 - 2, the highest surface elevations within OU No. 1 are encountered near the center of Site 78 (HPIA) where the elevation is approximately 30 ft above msl. Elevations drop off sharply to near 5 ft above msl at the banks of Beaver Dam Creek (north of Site 78, and north and west of Site 21), and the New River (southwest of Sites 24 and 78). The terrain in the area indicates that drainage of OU No. 1 is toward Codgels Creek which drains into the New River southwest of Site 24.

Overall, there are not any significant land surface features (e.g., valleys, ridges, etc.) at OU No. 1. Most of the area is devoted to industrial activities and therefore is covered with numerous buildings and other structures. Surface cover within OU No. 1 is predominately asphalt and concrete with some grass and soil covered areas along the southern and northern boundaries. The south-southeastern boundary of OU No. 1 is bordered by Codgels Creek, unnamed tributaries of Codgels Creek, marsh areas, and woodlands (Figure 3-2).

3.2.1.2 Site Geology

Surficial Sediments

The surficial sediments of the Undifferentiated Formation consist of interfingering beds of sand, clay, sandy clay and silt that contain some peat and shells of Quaternary and Miocene age. These sediments commonly extend to depths of 30 to 80 feet below ground surface (bgs) within the HPIA. Thickness of the surficial aquifer, which is within the Undifferentiated Formation, ranges from about 10 to 70 feet and, typically averages 25 feet. The clay, sandy clay, and silt beds that occur in the surficial aquifer are thin and discontinuous throughout. A semi-confining unit has been reported underlying the surficial aquifer within some portions of the HPIA, mainly in the north - northeastern areas (ESE, 1990). Other studies (Geophex, Law-Catlin) have reported an absence of a continuous confining /semi-confining layer within the HPIA. For more detailed information on the geology of the HPIA area (Site 78) refer to Section 3.0 of the OU No. 1 RI Report (Baker, June 1994).

3.2.1.3 <u>Population Distribution</u>

The existing land use pattern for the various developed geographic areas within the MCB are listed, per geographic area, on Table 3-5. In addition, the number of acres comprising each land use category has been estimated and provided on the table.

As shown in Table 3-5, Hadnot Point encompasses a total of 1,080 developed acres. The majority of this land is used for industrial purposes such as maintenance and supply/storage. Other major land uses include administration, troop housing, community development and recreation. Less common uses of the land at Hadnot Point include operations, training/instruction, medical, family housing, commercial development, and utilities.

3.2.2 Groundwater Migration Pathway

3.2.2.1 Site Hydrogeology

Surficial Aquifer

Recharge to the surficial aquifer is by rainfall. The aquifer receives more recharge in the winter than in the summer when much of the water evaporates or is transpired by plants before it can reach the water table. Most of the surficial groundwater is discharged to local streams, but some water passes through the underlying semiconfining unit. Recharge for the surficial aquifer is based on an average rainfall of 52 inches per year and an average recharge of 30 percent, or an annual recharge of approximately 16 inches per year. The remaining 70 percent of the rainfall is lost as surface runoff or evapotranspiration. Sixteen inches of recharge equates to 7,600,000 gpd per square mile or approximately 114,000,000 gpd for all of MCB, Camp Lejeune (based on 150 square miles of recharge area). Water levels in the wells tapping the surficial aquifer vary seasonally. The water table is generally highest in the winter and spring, and lowest in the summer and early fall.

Based on information available from UST and IR studies, transmissivity ranges from 3 to 525 gal/day/ft; storativity at 1.54×10^{-2} ; and hydraulic conductivity ranges from approximately 0.3 to 17 ft/day. The average pumping rates for the surficial aquifer based on the pump test data are from 0.5 to three gpm.

Although the aquifer is classified as GA (i.e., existing or a potential source of drinking water supply for humans), it is not used as a potable water source at MCB, Camp Lejeune. The primary reason for it's non-use is because of its low yielding production rates which are typically less than three gpm.

Castle Hayne

The principal water supply aquifer for MCB Camp Lejeune is the Castle Hayne aquifer. This aquifer primarily resides within the River Bend Formation, which consists of sand, cemented shells and limestone. The depth to the top of the aquifer ranges from 30 feet bgs to 80 feet bgs. The depth variations are attributed to the interpreted occurrences of mound features within the Castle Hayne, underlying collapse, and the top of the Castle Hayne Formation being an erosional surface (Geophex, 2002). The thickness of the aquifer in the HPIA is more than 300 feet.

Estimated transmissivity, hydraulic conductivity and storage coefficient values (unitless) for the Castle Hayne aquifer range from 6,100 to 183,300 gpd/ft, 14 to 91 ft/d and 2×10^{-4} to 1.9×10^{-3} , respectively. An aquifer pump test conducted by ESE (1990) in the HPIA, using an existing water supply well (HP642), indicates an average transmissivity and storage coefficient of 9,600 gpd/ft and 8.8×10^{-4} , respectively (ESE, 1990).

The vertical hydraulic conductivity of the Castle Hayne confining unit was estimated to range from 0.0014 to 0.41 ft/d. These values are comparable to those determined for silts and clays; therefore, this unit may only be partly effective at retarding the vertical movement of groundwater between the surficial and Castle Hayne aquifers (Cardinell, et al., 1993).

Recharge of the Castle Hayne aquifer at MCB Camp Lejeune is primarily received from the surficial aquifer. Natural discharge is to the New River and its major tributaries. The Castle Hayne aquifer provides roughly seven million gallons of water to MCB Camp Lejeune. Groundwater pumping has not significantly affected natural head gradients in the aquifer.

For more detailed information on the hydrogeology of the HPIA area (Site 78) refer to Section 3.0 of the OU No. 1 RI Report (Baker, June 1994).

In general, the groundwater flow is from east to west across Site 78 as shown on Figure 3-3. Static water elevations are taken regularly at Site 78 during the LTM program. For detailed groundwater contours at this site refer to recent LTM Reports (Baker, 2001), the Draft NAE Report for OU 1 (Baker, February 2002), or the Technology Evaluation for Site 78 (Baker, April 2002).

3.2.2.2 Potable Water Supply Inventory

Active potable water supply wells within a two-mile radius of the HPIA PA Sites are shown on Figure 3-4. Table 3-6 provides detailed information for each of these wells.

The OU No. 1 ROD (Baker, September 1994) specified restrictions on use of specific water supply wells in or near OU No. 1. The specific wells listed were HP-601, 602, 608, 630, 634, and 637. These wells were all inactive and/or permanently closed at the time the Final ROD was signed. All wells have since been permanently abandoned according to North Carolina Administrative Code Title 15A, Chapter 2C.0113 (Baker, June 2001). The ROD also specified restrictions on the installation of new supply wells within the operable unit.

3.2.2.3 Present Groundwater Conditions and Usage

The LUCIP for OU No. 1 restricts groundwater usage, and any construction activities that may contact groundwater within OU No. 1. The following section presents the aquifer use controls as documented in the LUCIP for OU No. 1 (Baker, June 2001).

Except for monitoring purposes, all use of groundwater within a 1,000 ft buffer surrounding known areas of groundwater contamination is prohibited. In addition, any activities, which may impact the area of known groundwater contamination are prohibited unless specifically approved by both NCDENR and USEPA. This includes installation and operation of water supply wells as well as any dewatering activities that draw water from the contaminated groundwater plume, even if they are located outside the 1,000 ft buffer. These controls are to remain in effect until it can be demonstrated that groundwater contaminants no longer remain at the sites.

3.2.3 Surface Water Migration Pathway

When evaluating the surface water pathway during a CERCLA PA, the likelihood of release to surface water, targets, and waste characteristics must be considered. Evaluating the likelihood of release requires a hypothesis as to whether hazardous substances are likely to have migrated from the sites to the surface water. When a direct release is not suspected, considerations addressing regional and local setting, such as distance to surface water and the flood potential at the site, must be evaluated.

3.2.3.1 Surface Water Hydrology

The majority of MCB Camp Lejeune is situated near sea level (i.e., estuarine conditions which are tidally influenced). The New River is the dominant surface water feature and receives drainage from most of OU No. 1. It flows in a southerly direction and empties into the Atlantic Ocean through the New River Inlet.

Overall, there are three main surface water bodies within OU No. 1. These include: Beaver Dam Creek, Codgels Creek (and unnamed tributaries), and the New River. The New River borders the operable unit to the southwest, Codgels Creek flows along the southern boundary of Site 78 (northern boundary of Site 24), and Beaver Dam Creek lies north of Site 78 across Holcomb Boulevard. All three of these surface water features are depicted on Figure 3-2. Note that Codgels Creek has several unnamed tributaries located west from the main stream. According to the NC DENR, Codgels Creek classifies as SC NSW and Beaver Dam Creek classifies as SB NSW.

The 100-year flood plain elevation for this area of MCB Camp Lejeune is approximately 10 ft above msl. OU No. 1 lies between elevations five and 30 ft above msl (Figure 3-2), therefore, some portions (e.g., Site 24 near Codgels Creek) of the OU No. 1 are within the 100-year flood plain.

3.2.3.2 Present Surface Water Conditions and Usage

Release of hazardous substances to surface water from past operations conducted at Hadnot Point could impact drinking water supplies, human food chain organisms, and sensitive environments. The evaluation of surface water pathway targets must, therefore, be included in the

characterization of setting. Target evaluation focuses on three areas: intakes supplying drinking water; fisheries; and surface water sensitive environments within a 5-mile downstream target distance limit.

Drinking Water Supply Intakes

The New River and its tributaries make up the major surface water body system present at MCB Camp Lejeune. As this system is tidally influenced, it is not considered as a viable source of potable water. The drinking water supply is derived from groundwater production wells located at various locations throughout the base. Additionally, the tributaries entering the New River are gaining waterways that provide little or no recharge to the underlying aquifers. Therefore, potential releases to surface water bodies at the base would not impact the target population.

Fisheries

Fisheries are contamination impact targets under the Human Food Chain Threat. Under CERCLA, a fishery is any area of a surface water body in which food chain organisms are taken or could be taken for human consumption on a subsistence, sporting, or commercial basis. This definition includes any portion of a body of water that could provide at least one fish, shellfish, crustacean, amphibian, or amphibious reptile for human consumption. The definition would not apply if the water body was sterile or closed to fishing for reasons not associated with the site (e.g., sewage contamination, red tide, contamination from other facilities).

The New River and its tributaries provide recreational fishing for residents and tourists of Onslow County throughout the year. Therefore, it is conceivable that releases to this surface water system could impact the existing fisheries and the target population.

Surface Water Sensitive Environments

Sensitive environments in the surface water pathway must lie in or adjacent to the 5-mile downstream target area of the New River. The only sensitive environment that meets this requirement is the presence of wetlands.

Wetlands also are identified as sensitive environments under CERCLA guidelines. The CERCLA definition of a wetland is an area that is sufficiently inundated or saturated by surface or groundwater to support vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Substantial areas of wetlands exist throughout the surface water system comprised of the New River and its tributaries. Releases to this system could potentially impact these environmentally sensitive areas. During the RI (Baker, June 1994) wetlands were identified for Site 78, as well as a complete ecological screening of the area. Refer to Figure 3-5 for a biohabitation map of Site 78 that includes wetland identification, as well as identification of wildlife areas, waterways, forested areas, and industrial/commercial areas.

3.2.4 Soil Exposure Pathway

Currently, the LUCIP for OU No. 1 implements a Boundary of Land Use Controls that prohibits land use for non-industrial purposes within the operable unit (Baker, June 2001).

The soil exposure pathway assesses the impact to human health and the environment by direct exposure to hazardous substances and areas of suspected contamination. This pathway differs from the other three migration pathways in that it accounts for contact with in-place hazardous substances at the site, rather than migration of substances from the site. The PA evaluation takes into account the likelihood of release, targets and waste characteristics for the soil exposure pathway. The likelihood of release and the waste characteristics are analogous to the other pathways; however, the targets are evaluated with regard to two different categories: resident population and nearby population. The resident population category deals with human, environmental, and resource targets located on or very near to the site. The nearby population threat accounts for the likelihood of residents within the surrounding area coming into contact with contamination which may be affiliated with the site.

Areas of suspected contamination are defined by the presence of hazardous substances. Thus, in general, most sources are considered areas of suspected contamination with potential impacts on population. There are two exceptions where a known source of contamination is considered to have no impact on population:

- Sources with more than 2 feet of cover, and
- Sources with an impenetrable cover, regardless of thickness.

In the above two scenarios, a soil exposure pathway is considered to be absent. The majority of the identified areas of concern at Hadnot Point are covered with an impenetrable surface (asphalt and/or concrete) and therefore are exempt from the soil exposure pathway. Four buildings, HP902, HP1120, HP1409 and the former location of HP1512, consist of small grassy areas and some unpaved roads. Therefore, they do not meet the above conditions for exemptions. These areas present the potential for inhalation, dermal contact and/or ingestion of contaminated site surficial soils and therefore would be evaluated for the surface soil pathway. It should be noted that if construction or any other activity involving the removal of the fill material at the other identified areas of concern was to occur, the scenario would be altered and development of a soil exposure pathway for those areas would also be required.

Another factor to consider is whether the soil in these areas of concern is typically agitated or penetrated in any way (i.e. digging). Most buildings in Hadnot Point are currently used for automotive/boat repair and heavy equipment storage. Agitation of the grass or soil covered areas most likely occurs when transporting various vehicles, boats, and other heavy equipment on, off, and around the site. This would increase the soil exposure pathway to those individuals (resident population) who work or come into contact with these agitated, unpaved soils. There is no significant threat to those individuals from the surrounding area (nearby population), as it is not likely that they would come into contact with potential contamination at the site.

3.2.5 Air Migration Pathways

3.2.5.1 Local Setting

The PA evaluation of the air pathway requires consideration of the same three factor categories identified in the previous pathway: waste characteristics, likelihood of release, and targets. The principal threat under the air pathway is the threat of airborne releases of hazardous substances.

Evaluating the likelihood of release requires professional judgment, based on site and pathway conditions, as to whether it is likely that release of a hazardous substance to the air, if it occurred, could be detected. This differs somewhat from the release evaluation for the groundwater and surface water migration pathways, where judgment is based on whether a release is likely to have occurred.

The targets evaluation is primarily concerned with identifying and evaluating the human population within the 1-mile target distance limit around the site, and sensitive environments within one-half mile. Because a release from the sites within Hadnot Point is not expected, the targets (residential, student, and worker population) are identified as secondary targets: targets that are less likely to be subjected to exposure from release of hazardous substances to the air. In addition, the entire area of Hadnot Point is, and always has been, used strictly for industrial purposes. There are no sensitive environments such as schools or day care centers in the near vicinity. The air pathway is the only pathway that evaluates impacts on population in this PA.

Again, because the majority of identified areas of concern are under a cover of asphalt and/or concrete, the likelihood for contamination to be detected in the air pathway is not probable. However, there is no analytical data confirming or denying the release of contaminants, especially from the locations containing grass or soil covered areas: HP902, HP1120, HP1409 and HP1512. Previous investigations around these buildings show detection of several contaminants, most likely resulting from both past and present uses of the facilities, that present a potential release through the air pathway. These are VOCs (including TCE and 1,2-DCE), and SVOC's (including napthalene, phenanthrene, fluoroanthrene, pyrene and benzene), typically found in high concentrations during previous soil gas sampling.

3.2.5.2 Present Air Conditions and Usage

Air quality in the HPIA is impacted by both stationary and mobile sources. Industrial operations in the vicinity that are potential pollution sources include petroleum and solvent storage facilities, painting and auto repair facilities, and vapor stripping tower emissions from ongoing remedial activities. Some of these potential sources are subject to emission controls but may generate residential particulates or other air quality degradents.

3.3 Air Station

This section describes the physical setting, topography, drainage characteristics, geology, hydrogeology, and ecological features of the Air Station area of the PA Sites. Information provided in this section is based on previous investigations at the Air Station, mainly the Sites 75 and 76 Pre-RI (Baker, November 1988), and on the PA field reconnaissance.

3.3.1 Local Environmental Setting

3.3.1.1 Site Topography and Surface Features

The site terrain is relatively flat and is covered by pavement and concrete. There are several shallow drainage swales (one foot deep or less) that run north to south across the site. Surface runoff from the sites not intercepted by a manmade structure may drain to Edwards Creek. Previous investigations at nearby IR Sites 75 and 76 indicate that groundwater in this area generally flows towards Edwards Creek. Topographic contour elevations are illustrated on Figure 2-7 for the Air Station PA Sites. A recent aerial photo is illustrated on Figure 2-8 and shows the land features of the PA Sites. As shown, the area surrounding the PA buildings is paved and there are drainage ditches that surround the area.

3.3.1.2 Site Geology

Site specific geology in the area of Buildings TC830, SAS113, AS116, AS118 and AS119 is unknown; however, information is available for nearby Sites 75 and 76, that are north of the PA Sites. The following section describes the site geology at Sites 75 and 76 during the Pre-RI (Baker, November 1998).

Site 75 is underlain by soils that are predominately sands and silty sands beneath a foot of surface top soil. From ground surface to a depth of three feet, the soil is a light brown silty sand with a trace of gray clay. The material is loose to medium dense and ranges from moist to damp. At approximately four feet bgs, the silt content decreases transitioning into a "cleaner" sand. The sand's color also changes as depth increases from a light brown to a dark gray.

Site 76 is underlain by layers of sand, silty sand, silty clay and clay, beneath a foot of organically rich surface top soil. The sands are fine grained, light brown to dark gray in color and range from loose to dense. Clay layers from two to five feet in thickness are interbedded throughout the sand layers. This stiff clay is light brown to red in appearance and shown signs of orange mottling. Fine silts are also common at the site and both the sands and clays that are encountered have varying degrees of silt among them.

3.3.1.3 Population Distribution

The existing land use pattern for the various developed geographic areas within the MCB are listed, per geographic area, on Table 3-5. In addition, the number of acres comprising each land use category has been estimated and provided on the table.

The Air Station area of concern is located entirely within the Camp Geiger portion of the Base. As shown in Table 3-5, Camp Geiger encompasses 216 acres, the majority of which is used for supply/storage and maintenance. Other major land uses include administration, troop housing, and community development. Less common land uses include operations, training/instruction, medical, family housing, commercial development, and utilities.

3.3.2 Groundwater Migration Pathway

3.3.2.1 Site Hydrogeology

Site specific hydrogeology in the area of Buildings TC830, SAS113, AS116, AS118 and AS119 is unknown; however, information is available for nearby Sites 75 and 76, that are north of the PA Sites. The following section describes the site hydrogeology at Sites 75 and 76 during the Pre-RI (Baker, November 1998).

Site 75

During the advancement of the borings, groundwater was encountered generally between 3.5 and 4.0 feet bgs at Site 75. This is approximately the same depth at which the silt content in the soil begins to decrease. Because the study area is wide open and grass covered, the entire area is a recharge zone characterized by moderate infiltration of precipitation.

Groundwater elevations were measured on February 26, 1996 from three existing monitoring wells, 75-GW01, 75-GW02, and 75-GW03, and two newly installed monitoring wells, 75-GW04 and 75-GW05 at Site 75. Figure 3-6 depicts a groundwater contour map of the surficial aquifer for the site. The measurements were adjusted to mean sea level and are reported on Table 3-7. Shallow groundwater flow is in the northeast direction with a change in elevation of over three feet, from 12.20 feet msl in the southern most monitoring well to 8.86 feet msl in the northern most monitoring well.

Site 76

During the advancement of the borings, groundwater was encountered between 4.0 and 5.0 feet bgs at Site 76. This is approximately the same depth where the clay layers (if encountered) show the orange mottling. Because the study area is predominantly open and grass covered, the area is a recharge zone characterized by moderate infiltration of precipitation.

Groundwater measurements were collected from the two existing monitoring wells, (76-GW01 and 76-GW02), and the three new monitoring wells (76-GW03, 76-GW04, and 76-GW05) installed during this investigation (Figure 3-6). The groundwater elevations, reported as elevations to mean sea level, ranged from a high of 11.20 feet msl in 76-GW04 to a low of 5.96 feet msl in 76-GW02. Table 3-8 is a summary of groundwater elevations at Site 76.

The groundwater flow direction in the surficial aquifer is to the southwest from northeast across the site. The validity of this northeast flow is confirmed by the fact that Site 76 is immediately adjacent to Site 75 which also has indicated a northeast groundwater flow direction.

The groundwater contours as illustrated on Figure 3-6 show that surficial groundwater flow in this area of the Base is generally northeast toward Edwards Creek. It can be assumed that groundwater flow in the area of the PA Sites is also north towards Edwards Creek.

3.3.2.2 Potable Water Supply Inventory

Active potable water supply wells are shown with a two mile radius on Figure 3-4. As shown there are a number of active water supply wells within a one mile radius of the Air Station PA Sites. Table 3-6 provides detailed information for each of these wells.

3.3.2.3 Present Groundwater Conditions and Usage

There are presently no groundwater usage restrictions near the Air Station PA Sites. Surficial groundwater is not used as a potable water supply source at the Base.

3.3.3 Surface Water Migration Pathway

When evaluating the surface water pathway during a CERCLA PA, the likelihood of release to surface water, targets, and waste characteristics must be considered. Evaluating the likelihood of release requires a hypothesis as to whether hazardous substances are likely to have migrated from the sites to the surface water. When a direct release is not suspected, considerations addressing regional and local setting, such as distance to surface water and the flood potential at the site, must be evaluated.

3.3.3.1 <u>Surface Water Hydrology</u>

The majority of MCB Camp Lejeune is situated near sea level (i.e., estuarine conditions which are tidally influenced). The New River is the dominant surface water feature and receives drainage from most of the Air Station. The surface water generally flows in a southerly direction and empties into the Atlantic Ocean through the New River Inlet (Figure 1-1).

Overall, there are two main surface water bodies (Edwards Creek and the New River into which it flows) that could be impacted by releases from the four sites of concern. It should be noted that there are IR Sites in this area of the Air Station that may potentially drain into Edwards Creek, and include Sites 89, 75, 76, and 44 as shown on Figure 3-7. Edwards Creek flows in an easterly direction across this portion of the Air Station, and eventually flows in the New River, as shown in Figures 3-6 and 3-7. Stick Creek is located northeast of the Air Station PA Sites and also flows into the New River. Drainage from the PA Sites may also flow into Stick Creek and eventually the New River.

The 100-year flood plain elevation for this area of MCB Camp Lejeune is approximately 10 ft above msl. Some portions of the Air Station are within the 100-year flood plain. The PA Sites within the Air Station are also potentially susceptible to flooding.

3.3.3.2 Present Surface Water Conditions and Usage

Release of hazardous substances to surface water from past operations conducted at the Air Station PA Sites could impact drinking water supplies, human food chain organisms, and sensitive environments. The evaluation of surface water pathway targets must, therefore, be included in the characterization of the setting. Target evaluation focuses on three areas: intakes

supplying drinking water; fisheries; and surface water sensitive environments within a 5-mile downstream target distance limit.

Drinking Water Supply Intakes

The New River and its tributaries make up the major surface water body system present at MCB Camp Lejeune. As this system is tidally influenced, it is not considered as a viable source of potable water. The drinking water supply is derived from groundwater production wells located at various locations throughout the base. Additionally, the tributaries entering the New River are gaining waterways that provide little or no recharge to the underlying aquifers. Therefore, potential releases to surface water bodies at the base would not impact the target population.

Fisheries

Fisheries are contamination impact targets under the Human Food Chain Threat. Under CERCLA, a fishery is any area of a surface water body in which food chain organisms are taken or could be taken for human consumption on a subsistence, sporting, or commercial basis. This definition includes any portion of a body of water that could provide at least one fish, shellfish, crustacean, amphibian, or amphibious reptile for human consumption. The definition would not apply if the water body was sterile or closed to fishing for reasons not associated with the site (e.g., sewage contamination, red tide, contamination from other facilities).

The New River and its tributaries provide recreational fishing for residents and tourists of Onslow County throughout the year. Therefore, it is conceivable that releases to this surface water system could impact the existing fisheries and the target population.

Surface Water Sensitive Environments

Sensitive environments in the surface water pathway must lie in or adjacent to the 5-mile downstream target area of the New River. The only sensitive environment that meets this requirement is the presence of wetlands.

Wetlands also are identified as sensitive environments under CERCLA guidelines. The CERCLA definition of a wetland is an area that is sufficiently inundated or saturated by surface or groundwater to support vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Substantial areas of wetlands exist throughout the surface water system comprised of the New River and its tributaries. Releases to this system could potentially impact these environmentally sensitive areas. Wetlands located in the vicinity of the Air Station PA Sites are identified on Figure 3-7 and include Edwards Creek, Stick Creek and the New River.

3.3.4 Soil Exposure Pathway

The soil exposure pathway assess the impact to human health and the environment by direct exposure to hazardous substances and areas of suspected contamination. The pathway differs from the other three migration pathways in that it accounts for contact with in-place hazardous substances at the site, rather than migration of substances from the site.

The PA evaluation takes into account the likelihood of release, targets and waste characteristics for the soil exposure pathway. The likelihood of release and the waste characteristics are analogous to the other pathways; however, the targets are evaluated with regard to two different categories: resident population and nearby population. The resident population category deals with human, environmental, and resources targets located on or very near to the site. The nearby population threat accounts for the likelihood of residents within the surrounding area coming into contact with contamination which may be affiliated with the site.

Areas of suspected contamination are defined by the presence of hazardous substances. Thus, in general, most sources are considered areas of suspected contamination with potential impacts on population. There are two exceptions where a known source of contamination is considered to have no impact on population:

- Sources with more than 2 feet of cover, and
- Sources with an impenetrable cover, regardless of thickness.

In the above two scenarios, a soil exposure pathway is considered to be absent. The majority of the identified areas of concern at the Air Station are covered with an impenetrable surface (asphalt and/or concrete) and therefore are exempt from the soil exposure pathway. Two buildings, TC830 and AS119, consist of small grassy areas and therefore do not meet the above conditions for exemptions. These area present the potential for inhalation, dermal contact and or/ingestion of contaminated site surficial soils and therefore would be evaluated for the surface soil pathway. It should be noted that if construction or any other activity involving the removal of the fill material at the other identified areas of concern was to occur, the scenario would be altered and development of a soil exposure pathway for those areas would be required.

Another factor to consider is whether the soil in these areas of concern are typically agitated or penetrated in any way (i.e. digging). The buildings of concern at the Air Station are currently used for storage and automobile maintenance. Agitation of the grassy areas most likely occurs when transporting automobiles or other such heavy equipment on, off, and around the site. This would increase the soil exposure pathway to those individuals (resident population) who work or come into contact with these agitated, unpaved soils. There is no significant threat to those individuals from the surrounding area (nearby population), as it is not likely that they would come into contact with potential contamination at the site.

3.3.5 Air Migration Pathway

3.3.5.1 Local Setting

The PA evaluation of the air pathway requires consideration of the same three factor categories identified in the previous pathway: waste characteristics, likelihood of release, and targets. The principal threat under the air pathway is the threat of airborne releases of hazardous substances.

Evaluating the likelihood of release requires professional judgment, based on site and pathway conditions, as to whether it is likely that release of a hazardous substance to the air, if it occurred, could be detected. This differs somewhat from the release evaluation for the groundwater and surface water migration pathways, where judgment is based on whether a release is likely to have occurred.

The targets evaluation is primarily concerned with identifying and evaluating the human population within the 1-mile target distance limit around the site, and sensitive environments within one-half mile. Because a release from the sites within the Air Station is not expected, the targets (residential, student, and worker population) are identified as secondary targets: targets that are less likely to be subjected to exposure from release of hazardous substances to the air. In addition, nearly the entire area of the Air Station is, and always has been, used strictly for industrial purposes. There are no sensitive environments such as schools or day care centers in the near vicinity. The air pathway is the only pathway that evaluates impacts on population in this PA.

Again, because the majority of identified areas of concern are under a cover of asphalt and/or concrete, the likelihood for contamination to be detected in the air pathway is not probable. However, there is no analytical data confirming or denying the release of contaminants, especially from the locations containing grass or soil covered areas: TC830 and AS119. The only building in the Air Station where a previous investigation was conducted in the near vicinity is Building AS116. The investigation was conducted at nearby Building AS114. VOCs and SVOCs were detected in excess of SWMU criteria and are currently being investigated further.

3.3.5.2 Present Air Conditions and Usage

Air quality at the Air Station PA Sites is impacted by both stationary and mobile sources. Operations in the vicinity that are potential pollution sources include petroleum and solvent storage facilities, and painting and auto repair facilities.

3.4 Montford Point

This section describes the physical setting, topography, drainage characteristics, geology, hydrogeology, and ecological features of the PA Sites in the Montford Point area of Camp Lejeune. Information provided in this section is based on previous investigations at Montford Point and on the PA field reconnaissance.

3.4.1 Local Environmental Setting

3.4.1.1 Site Topography and Surface Features

The area of the PA Sites, is relatively flat with a slight slope to the southeast. Most of the site is currently a cleared area that is paved. Figure 2-8 presents the topography and surface features identified at the PA Sites.

3.4.1.2 Site Geology

Site specific geology in the area of Buildings M119 and SM173 is unknown; however, information is available for nearby Site 16, that is southwest of the PA Sites. The following section describes the site geology at Site 16 during the RI (Baker, January 1996).

The RI was limited to investigating the shallow groundwater zone; therefore, site-specific geology describes the site to depth of approximately 35 feet bgs. The site is primarily underlain by sands and silty sands with lenses and/or discontinuous layers of sand and clay, clay, and sandy clay. These surficial soils represent the Quaternary age "undifferentiated" Formation that characterizes the shallow water table aquifer. Results of the standard penetration tests (ASTM D1586-84) indicates the relative density of the soils range from loose to very dense. Unified Soil Classification System (USCS) classification for the surficial soils identified at the site are SM (silty sand), SP (poorly graded sands with little to no fines), and CL (sandy clay and clay). Fill material was identified at some borehole locations (within the open site area), ranging in thickness from one to nine feet. This fill material consisted of replaced soil, as well as treated timbers, rubber tires, and gravel. Only shallow groundwater monitoring wells were installed during the RI, therefore, no specific information on the depth of the surficial soils or the lithology of the underlying soils is available.

Geologic cross-sections were developed for the surficial soils based on samples collected during the RI. As shown on Figure 3-8, two cross-sections were developed using the groundwater monitoring boreholes. Cross-section A-A' (Figure 3-9) depicts the surficial lithology from north to south and cross-section B-B' (Figure 3-10) depicts the lithology from southwest to northeast of the surficial soils.

3.4.1.3 <u>Population Distribution</u>

The following sections concerning land use demographics were taken from the OU No. 8 (Site 16) RI (Baker, January 1996).

Montford Point is one of the Marine Corps Bases' oldest areas and has seen little planning over the decades. Most of the 233 acres of development are congregated on the eastern side of Montford Landing Road. Of the 233 acres of development, 35 percent (i.e., 82 acres) consist of troop housing. Community facilities are located near troop housing in the northeast section of the area. The troop housing facilities located at the southern tip of Montford Point have very limited community facilities nearby.

Classroom training facilities are scattered throughout the developed areas of Montford Point. This use constitutes nearly 21 percent (i.e., 48 acres) of the developed area and, therefore, is the second largest land use category existing at Montford Point. Site 16 and Buildings M119 and SM173 are located within this area.

The existing land use pattern for the various developed geographic areas within the MCB are listed, per geographic area, on Table 3-5. In addition, the number of acres comprising each land use category has been estimated and provided on the table. Site 16 and Buildings M119 and SM172 are located in the northern region of MCB Camp Lejeune in Montford Point (Camp Johnson).

3.4.2 Groundwater Migration Pathway

3.4.2.1 Site Hydrogeology

Groundwater was encountered during the RI at elevations ranging from 1.37 to 6.93 feet above msl. Measured shallow groundwater levels for Site 16 are presented on Table 3-9. The groundwater elevation contours for the shallow aquifer on March 27, 1995 are presented on Figure 3-11. The contour maps indicate a linear flow towards the southeast, in the direction of Northeast Creek. Recharge for this area is from the northwest. The shallow groundwater gradient measured from well 16-MW01 to well 16-MW04 to the southeast for December 11, 1994 was 0.002 ft/ft and from well 16-MW-1 to 16-MW03 for March 27, 1995 was 0.004 ft/ft. Shallow groundwater discharges to Northeast Creek.

The shallow aquifer was characterized by performing in situ rising and falling head slug tests in

all newly installed monitoring wells. The tests were performed on December 6 and 7, 1994. An

electronic data logger (In Situ Hermit Model SE2000) and pressure transducer assembly were

used to record the recovery of groundwater in the monitoring wells to static level. All data was

recorded on logarithmic scale to more closely monitor the initial changes in groundwater

elevation. The data resulting from the slug tests were converted into time (in minutes) and the

corresponding change in water level displacement (in feet). Results from the rising head tests

were analyzed using Geraghty & Miller's AQTESOLV computer program for performing

quantitative groundwater assessments. Results from falling head tests were analyzed for wells

16-MW02, 16-MW05, and 16-MW06 due to the fact that these shallow wells exhibited

groundwater levels at or above the top of the sand packs, making the falling head tests valid at

these locations. The Bouwer and Rice solution for slug tests in unconfined aquifers was used to

evaluate all test data. For the input parameters and plots generated from the slug tests refer to

Appendix E of the Site 16 RI Report (Baker, January 1996).

Table 3-10 lists the K values obtained from the data analysis, the average hydraulic gradient from

the two groundwater elevation contour maps, the assumed effective porosity, and the calculated

value for groundwater velocity. The average estimated K value from the six wells (total of 9

tests) was 5.69 feet/day (2.01 x 10-3 cm/sec), which is within the typical range for silty sands

(Freeze/Cherry, 1979). The average hydraulic gradient from groundwater measurements between

wells 16-MW01 and 16-MW04 on December 11, 1994, and wells 16-MW01 and 16-MW03 on

March 27, 1995 was 0.003 ft/ft. Published effective porosity values indicate a range of 25 to 50

percent for sands and silts (Freeze/Cherry, 1979). Due to the silty nature of the sands, a value of

35 percent was used for effective porosity. The estimated average linear groundwater velocity

was calculated by using the following formula:

V=Ki/n

Where: V = groundwater velocity

K = hydraulic conductivity

i = hydraulic gradient

n = effective porosity

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Using these variables, the groundwater velocity (V) in a northwest to southeast direction is estimated to be 0.05 feet/day (18.25 feet/year). This is a conservative estimate because of the nature of the silty sand and the variability in the estimated K values from the slug tests. An approximate transmissivity value (T) can be obtained from multiplying the hydraulic conductivity (K) by the saturated thickness (b) of the aquifer. Using a saturated thickness of 33.5 feet, which corresponds to the maximum depth of the shallow wells installed at Site 16, an approximate T value for the shallow aquifer in this direction is 190.62 feet²/day (14.3 x 10² gallons/day/ft). A recent hydrogeologic investigation conducted by Baker in the Camp Geiger area (1994), which included an aquifer pump test within the shallow water-bearing zone (approximately 25 foot depth), indicated T and K values of 94.92 ft²/day (7.1 x 10² gallons/day/ft) and 6.3 feet/day (2.2 x 10-³ cm/sec), respectively. Values for T determined from a pump test performed at Hadnot Point on the opposite side of the New River from Camp Geiger were 75 feet²/day (5.61 x 10² gallons/day/ft). The average transmissivity value from these two pump tests is 85 feet²/day (6.36 x 10² gallons/day/ft). The calculated transmissivity value of 190.62 feet²/day from the slug tests is twice the average pump test value.

A tidal study was conducted at Site 16 to determine the influence of tidal effects on the shallow groundwater within the site boundaries. A staff gauge was installed in Northeast Creek, approximately 50 feet from shore. It was placed in a southeasterly direction from the former burn dump. A pressure transducer was attached to the staff gauge, positioned approximately 1 foot off the creek bottom. Pressure transducers were also installed in monitoring wells 16-MW03, just on-shore from Northeast Creek (approximately 10 feet), and 16-MW05, within the former burn dump. Measurements were recorded with an In-Situ Hermit Model 2000 data logger and a Hermit Model 1000C data logger over a period of three days (December 1-4, 1994). Figure 3-12 presents a graph of the readings from the staff gauge, and monitoring wells 16-MW03 and 16-MW05. The "0" mark on the Y-axis is referenced to the level of the creek and groundwater levels in the monitoring wells at the start of the study.

The staff gauge in Northeast Creek indicated fluctuations in the water surface from 0.2 to 0.7 feet. Well 16-MW03, near Northeast Creek, exhibited groundwater fluctuations of 0.1 to 0.3 feet. No fluctuations in groundwater were exhibited in well 16-MW05, which is located approximately 470 feet from Northeast Creek. Figure 3-12 illustrates that the cyclic nature of the fluctuations of the creek and groundwater in well 16-MW03 are "offset". A rise in the level of the creek coincides with a decrease in the groundwater level. The data indicates that there is a tidal effect

on the shallow groundwater at Site 16, but there is a delay between the highest elevations of the groundwater and the creek. The tidal influence from Northeast Creek reaches inland, but at a distance probably less than 300 feet.

3.4.2.2 Potable Water Supply Inventory

Active potable water supply wells are shown with a two-mile radius on Figure 3-4. As shown, there are no active water supply wells within a 1-mile and 2-mile radius of the Montford Point PA Sites.

3.4.2.3 Present Groundwater Conditions and Usage

There are presently no groundwater usage restrictions near the Montford Point PA Sites. Surficial groundwater is not used as a potable water supply source at the Base.

3.4.3 Surface Water Migration Pathway

When evaluating the surface water pathway during a CERCLA PA, the likelihood of release to surface water, targets, and waste characteristics must be considered. Evaluating the likelihood of a release requires a hypothesis as to whether hazardous substances are likely to have migrated from the sites to the surface water. When a direct release is not suspected, considerations addressing regional and local setting, such as distance to surface water and the flood potential at the site, must be evaluated.

3.4.3.1 Surface Water Hydrology

The majority of MCB Camp Lejeune is situated near sea level (i.e., estuarine conditions which are tidally influenced). The New River and Northeast Creek are the dominant surface water features in the Montford Point area, and receive drainage from most of Montford Point. In the area of the PA Sites, the Northeast Creek is effectively a bay of the New River and thus will be included in the discussion as part of the New River. The New River flows in a southerly direction and eventually empties into the Atlantic Ocean through the New River Inlet (Figure 1-1).

The New River is the only surface water body that could be impacted by releases from the two Montford Point PA Sites. The New River borders the PA Sites to the east and southeast and is depicted on Figures 3-11 and 3-13.

The 100-year flood plain elevation for this area of MCB Camp Lejeune is approximately 10 ft above msl. Some portions of Montford Point are within the 100-year flood plain. PA Sites M119 and SM173 are susceptible to flooding during heavy precipitation events.

3.4.3.2 Present Surface Water Conditions and Usage

Release of hazardous substances to surface water from past operations conducted at Montford Point could impact drinking water supplies, human food chain organisms, and sensitive environments. The evaluation of surface water pathway targets must, therefore, be included in the characterization of setting. Target evaluation focuses on three areas: intakes supplying drinking water; fisheries; and surface water sensitive environments within a 5-mile downstream target distance limit.

Drinking Water Supply Intakes

The New River and its tributaries make up the major surface water body system present at MCB Camp Lejeune. As this system is tidally influenced, it is not considered as a viable source of potable water. The drinking water supply is derived from groundwater production wells located at various locations throughout the base. Additionally, the tributaries entering the New River are gaining waterways that provide little or no recharge to the underlying aquifers. Therefore, potential releases to surface water bodies at the base would not impact the target population.

Fisheries

Fisheries are contamination impact targets under the Human Food Chain Threat. Under CERCLA, a fishery is any area of a surface water body in which food chain organisms are taken or could be taken for human consumption on a subsistence, sporting, or commercial basis. This definition includes any portion of a body of water that could provide at least one fish, shellfish, crustacean, amphibian, or amphibious reptile for human consumption. The definition would not apply if the water body was sterile or closed to fishing for reasons not associated with the site (e.g., sewage contamination, red tide, contamination from other facilities).

The New River and its tributaries provide recreational fishing for residents and tourists of Onslow County throughout the year. Therefore, it is conceivable that releases to this surface water system could impact the existing fisheries and the target population.

Surface Water Sensitive Environments

Sensitive environments in the surface water pathway must lie in or adjacent to the 5-mile downstream target area of the New River. The only sensitive environment that meets this requirement is the presence of wetlands.

Wetlands also are identified as sensitive environments under CERCLA guidelines. The CERCLA definition of a wetlands is an area that is sufficiently inundated or saturated by surface or groundwater to support vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Substantial areas of wetlands exist throughout the surface water system comprised of the New River and its tributaries. Releases to this system could potentially impact these environmentally sensitive areas. Wetlands have been identified for the Montford Point PA Sites as illustrated on Figure 3-13.

3.4.4 Soil Exposure Pathway

The soil exposure pathway assess the impact to human health and the environment by direct exposure to hazardous substances and areas of suspected contamination. This pathway differs from the other three migration pathways in that it accounts for contact with in-place hazardous substances at the site, rather than migration of substances from the site.

The PA evaluation takes into account the likelihood of release, targets and waste characteristics for the soil exposure pathway. The likelihood of release and the waste characteristics are analogous to the other pathways; however, the targets are evaluated with regard to two different categories: resident population and nearby population. The resident population category deals with human, environmental, and resource targets located on or very near to the site. The nearby population threat accounts for the likelihood of residents within the surrounding area coming into contact with contamination which may be affiliated with the site.

Areas of suspected contamination are defined by the presence of hazardous substances. Thus, in general, most sources are considered areas of suspected contamination with potential impacts on population. There are two exceptions where a known source of contamination is considered to have no impact on population:

- Sources with more than 2 feet of cover, and
- Sources with an impenetrable cover, regardless of thickness.

In the above two scenarios, a soil exposure pathway is considered to be absent. The majority of the identified areas at Montford Point are covered with an impenetrable surface (asphalt and/or concrete) and therefore are exempt from the soil exposure pathway. Both buildings in the area, M119 and the former location of SM173 consist of small grassy areas and unpaved roads. Therefore, they do not meet the above conditions for exemptions. These areas present the potential for inhalation, dermal contact and/or ingestion of contaminated site surficial soils and therefore would be evaluated for the surface soil pathway. It should be noted that if construction or any other activity involving the removal of the fill material at the other identified areas on concern was to occur, the scenario would be altered and development of a soil exposure pathway for those areas would also be required.

Another factor to consider is whether the soil in these areas of concern is typically agitated or penetrated in any way (i.e. digging). The buildings at Montford Point are currently used for an automobile vehicle maintenance shop and vehicle wash rack. Agitation of the grass or unpaved roads most likely occurs when transporting the vehicles on, off, and around the site. This would increase the soil exposure pathway to those individuals (resident population) who work or come into contact with these agitated, unpaved soils. There is no significant threat to those individuals from the surrounding area (nearby population), as it is not likely that they would come into contact with potential contamination at the site.

3.4.5 Air Migration Pathway

3.4.5.1 Local Setting

The PA evaluation of the air pathway requires consideration of the same three factor categories identified in the previous pathway: waste characteristics, likelihood of release, and targets. The principal threat under the air pathway is the threat of airborne releases of hazardous substances.

Evaluating the likelihood of release requires professional judgment, based on site and pathway conditions, as to whether it is likely that release of a hazardous substance to the air, if it occurred, could be detected. This differs somewhat from the release evaluation for the groundwater and surface water migration pathways, where judgment is based on whether a release is likely to have occurred.

The targets evaluation is primarily concerned with identifying and evaluating the human population within the 1-mile target distance limit around the site, and sensitive environments with one half-mile. Because a release from the sites within Montford Point is not expected, the targets (residential, student, and worker) are identified as secondary targets: targets that are less likely to be subjected to exposure from release of hazardous substances to the air. In addition, nearly the entire area of Montford point is, and always has been, used mainly for industrial purposes. There are no sensitive environments such as schools or day care centers in the near vicinity. The air pathway is the only pathway that evaluates impacts on population in this PA.

Again, because the majority of identified areas of concern are under a cover of asphalt and/or concrete, the likelihood for contamination to be detected in the air pathway is not probable. However, there is no analytical data confirming or denying the release of contaminants, especially from the locations containing grass or soil covered areas. No previous investigations have been conducted at Building M119 and former Building SM173. However, the SWMU program is currently investigating the wash rack and oil/water separator in this location. Findings from the SWMU investigation are presented in Appendix H, SM173.

3.4.5.2 Present Air Conditions and Usage

Air quality at Montford Point is impacted by both stationary and mobile sources. Operations in the vicinity that are potential pollution sources include petroleum and solvent storage facilities and painting and auto repair facilities. .

TABLE 3-1

CLIMATIC DATA SUMMARY MARINE CORPS AIR STATION, NEW RIVER PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

								Mean Number of Days With				
	Precipitation (Inches)			Relative Humidity	Temperature (Fahrenheit)			Precipitation		Temperature		
	Maximum	Minimum	Average	(Percent)	Maximum	Minimum	Average	>=0.01"	>=0.5"	>=90F	>=75F	<=32F
January	7.5	1.4	4.0	79	54	34	44	11	2	0	1	16
February	9.1	.9	3.9	78	57	36	47	10	3	0	2	11
March	8	.8	3.9	80	64	43	54	10	3	*	5	5
April	8.8	.5	3.1	79	73	51	62	8	2	1	13	*
May	8.4	.6	4.0	83	80	60	70	10	3	2	25	0
June	11.8	2.2	5.2	84	86	67	77	10	4	7	29	0
July	14.3	4.0	7.7	86	89	72	80	14	5	13	31	0
August	12.6	1.7	6.2	89	88	71	80	12	4	11	31	0
September	12.8	.8	4.6	89	83	66	75	9	3	4	27	0
October	8.9	.6	2.9	86	75	54	65	7	2	*	17	*
November	6.7	.6	3.2	83	. 67	45	56	8	2	0	7	3
December	6.6	.4	3.7	81	58	37	48	9	2	0	2	12
Annual	65.9	38.2	52.4	83	73	53	63	118	35	39	189	48

Notes:

^{* =} Mean no. of days less than 0.5 days Source: Naval Oceanography Command Detachment, Asheville, North Carolina. Measurements obtained from January 1955 to December 1990.

TABLE 3-2

GEOLOGIC AND HYDROGEOLOGIC UNITS IN THE COASTAL PLAIN OF NORTH CAROLINA PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

	GEOLOGIC U	HYDROGEOLOGIC UNITS				
System	Series	Formation	Aquifer and Confining Unit			
Quaternary	Holocene/Pleistocene	Undifferentiated	Surficial Aquifer			
	Pliocene	Yorktown Formation (1)	Yorktown Confining Unit Yorktown Aquifer			
Tertiary	Miocene	Eastover Formation (1) Pungo River Formation (1) Belgrade Formation (2)	Pungo River Confining Unit Pungo River Aquifier Castle Hayne Confining Unit			
	Oligocene	River Bend Formation	Castle Hayne Aquifier			
	Eocene	Castle Hayne Formation	Beaufort Confining Unit (3)			
·	Palocene	Beaufort Formation	Beaufort Aquifer			
		Peedee Formation	Peedee Confining Unit Peedee Aquifer			
Cretaceous	Upper Cretaceous	Black Creek and Middendorf Formations	Black Creek Confining Unit Black Creek Aquifer			
		Cape Fear Formation	Upper Cape Fear Confining Unit Upper Cape Fear Aquifer Lower Cape Fear Confining Unit Lower Cape Fear Aquifer			
	Lower Cretaceous (1)	Unnamed Deposits (1)	Lower Cretaceous Confining Unit Lower Cretaceous Aquifier (1)			
Pre-Creta	ceous Basement Rocks					

Source: Cardinell, et al., 1993

Geologic and hydrologic units not present beneath Camp Lejeune.
 Constitutes part of the surficial aquifer and Castle Hayne confining unit in the study area.
 Estimated to be confined to deposits of Paleocene age in the study area.

TABLE 3-3

HYDRAULIC PROPERTY ESTIMATES OF THE CASTLE HAYNE AQUIFER AND CONFINING UNIT PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Hydraulic Properties	USGS Phase I Study ⁽¹⁾	USGS Aquifer Test ⁽²⁾	ESE, Inc. ⁽³⁾	NC DENR Aquifer Test ⁽⁴⁾	RASA Estimate ⁽⁵⁾
Aquifer transmissivity (cubic foot per day per square foot times foot of aquifer thickness)	4,300 to 24,500 average 9,500	1,140 to 1,325	820 to 1,740 average 1,280	900	10,140 to 26,000
Aquifer hydraulic conductivity (foot per day)	14 to 82 average 35	20 to 60		18 to 91 average 54	45 to 80 average 65
Aquifer storage coefficient (dimensionless)		2.0 x 10 ⁻⁴ to 2.2 x 10 ⁻⁴	5.0×10^{-4} to 1.0×10^{-3} average 8.0×10^{-4}	1.9 x 10 ⁻³	
Confining-unit vertical hydraulic conductivity (foot per day)		3.0 x 10 ⁻² to 4.1 x 10 ⁻¹	1.4 x 10 ⁻³ to 5.1 x 10 ⁻² average 3.5 x 10 ⁻³	-	

Notes:

- Analysis of specific capacity data from Harned and others (1989).
- Aquifer test at well HP-708.
- Aquifer test at Hadnot Point well HP-462 from Environmental Sciences and Engineering, Inc. (1988). Unpublished aquifer test data at well X24s2x, from NC DENR well records (1985).
- Transmissivities based on range of aquifer thickness and average hydraulic conductivity from Winner and Coble (1989).

Source: Cardinell, et al., 1993.

TABLE 3-4

PROTECTED SPECIES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Species	Protected Classification
Animals:	
American alligator (Alligator mississippienis)	SC
Bachmans sparrow (Aimophilia aestivalis)	FCan, SC
Green (Atlantic) turtle (Chelonia m. mydas)	T(f), T(s)
Loggerhead turtle (Caretta caretta)	T(f), T(s)
Peregrine falcon (Falco peregrinus)	E(f), E(s)
Piping plover (Charadrius melodus)	T(f), T(s)
Red!cockaded woodpecker (Picoides borealis)	E(f), E(s)
Southern Hognose Snake (<u>Heterodon simus</u>)	FCan, SR
Diamondback Terrapin (Malaclemys terrapin)	FCan, SC
Carolina Gopher Frog (Rana capito capito)	FCan, SC
Cooper's Hawk (Accipiter cooperii)	SC
Eastern Diamondback Rattlesnake (Crotalus adamanteus)	SR
Eastern Coral Snake (Micrurus fulvius)	SR
Pigmy Rattlesnake (Sistrurus miliarius)	SR
Black Bear (Ursus americanus)	SR
Plants:	
Rough!leaf loosestrife (Lysimachia asperulifolia)	E(f), E(s)
Seabeach Amaranth (Amaranthus pumilus)	T(f), T(s)
Chapman's Sedge (Carex chapmanii)	FCan
Hirst's Witchgrass (Dichanthelium sp.)	FCan
Pondspice (Litsea aestivalis)	FCan
Boykin's Lobelia (Lobelia boykinii)	FCan
Loose Watermilfoil (Myriophyllum laxum)	FCan,T(s)
Awned Meadowbeauty (Rhexia aristosa)	FCan,T(s)
Carolina Goldenrod (Solidago pulchra)	FCan, E(s)
Carolina Asphodel (Tofieldia glabra)	FCan
Venus Flytrap (Dionaea muscipula)	FCan
Flaxleaf Gerardia (Agalinis linifolia)	SR
Pinebarrens Goober Grass (Amphicarpum purshii)	SR
Longleaf Three-awn (Aristida palustris)	SR
Pinebarrens Sandreed (<u>Calamovilfa brevipilis</u>)	E(s)
Warty Sedge (Carex verrucosa)	SR
Smooth Sawgrass (Cladium mariscoides)	SR
Leconte's Flatsedge (Cyperus lecontei)	SR
Erectleaf Witchgrass (Dichanthelium erectifolium)	ŚR
Horsetail Spikerush (Eleocharis equisetoides)	SR
Sand Spikerush (Eleocharis montevidensis)	SR
Flaxleaf Seedbox (Ludwigia linifolia)	SR

TABLE 3-4 (Continued)

PROTECTED SPECIES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Species	Protected Classification
Plants (cont.):	
Torrey's Muhley (Muhlenbergia torreyana)	E(s)
Southeastern Panic Grass (Panicum tenerum)	SR
Spoonflower (Peltandra sagittifolia)	SR
Shadow-witch (Ponthieva racemosa)	SR
West Indies Meadowbeauty (Rhexia cubensis)	SR
Pale Beakrush (Rhynchospora pallida)	SR
Longbeak Baldsedge (Rhynchospora scirpoides)	SR
Tracy's Beakrush (Rhynchospora tracyi)	SR
Canby's Bulrush (Scirpus etuberculatus)	SR
Slender Nutrush (Scleria minor)	SR
Lejeune Goldenrod (Solidago sp.)	SR
Dwarf Bladderwort (<u>Utricularia</u> olivacea)	T(s)
Elliott's Yellow-eyed Grass (Xyris elliottii)	SR
Carolina Dropseed (Sporobolus sp.)	T(s)

Legend:

E(f) = Federal Endangered

T(f) = Federal Threatened

Fcan = Candidate for Federal Listing

E(s) = State Endangered T(s) = State Threatened SC = State Special Concern

SR = State Rare

Source: LeBlond, 1994

TABLE 3-5

LAND UTILIZATION: DEVELOPED AREAS ACRES/LAND USE (PERCENT) PA SITES

PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

Geographic Area	Oper.	Training (Instruc.)	Maint.	Supply/ Storage	Medical	Admin.	Family Housing	Troop Housing	СМ	СО	Recreat.	Utility	Total
Hadnot Point	31 (2.9)	15 (1.4)	154 (14.3)	157 (14.4)	10 (0.9)	122 (11.3)	22 (2.0)	196 (18.1)	115 (10.7)	36 (3.3)	182 (16.9)	40 (3.7)	1,080 (100)
Paradise Point	1 (0)	, i	3 (0.4)	1 (0)			343 (34)	19 (1.9)	31 (3.1)	·	610 (60.4)	2 (0.2)	1,010 (100)
Berkeley Manor/ Watkins Village							406 (80)		41 (8.1)	1 (0.2)	57 (11.2)	2 (0.5)	507 (100)
Midway Park		1 (0.4)		2 (0.7)		2 (0.7)	248 (92.2)		8 (3.0)	3 (1.1)	4 (1.5)	1 (0.4)	269 (100)
Tarawa Terrace I and II			3 (0.5)			1 (0.3)	428 (77.4)		55 (9.9)	11 (2.0)	47 (8.5)	8 (1.4)	553 (100)
Knox Trailer							57 (100)						57 (100)
French Creek	8 (1.4)	1 (0.2)	74 (12.7)	266 (45.6)	3 (0.5)	7 (1.2)		122 (20.9)	22 (3.8)	6 (1.0)	74 (12.7)		583 (100)
Courthouse Bay		73 (28.6)	28 (10.9)	14 (5.5)		12 (4.7)	12 (4.7)	43 (16.9)	15 (5.9)	4 (1.6)	43 (16.9)	11 (4.3)	255 (100)
Onslow Beach	6 (9.8)	1 (1.6)	3 (4.8)	2 (3.2)	1 (1.6)	2 (3.2)	:	2 (3.2)	12 (19.3)		25 (40.3)	8 (13.0)	62 (100)
Rifle Range		1 (1.3)	1 (1.3)	7 (8.8)	1 (1.3)	5 (6.3)	7 (8.8)	30 (37.5)	5 (6.3)	1 (1.3)	9 (11.3)	13 (16.3)	80 (100)
Camp Geiger	4 (1.9)	15 (6.9)	19 (8.8)	50 (23.1)		23 (10.6)	:	54 (25.0)	27 (12.5)	2 (1.0)	16 (7.4)	6 (2.8)	216 (100)
Montford Point	6 (2.6)	48 (20.5)	2 (0.9)	4 (1.7)	2 (0.9)	9 (3.9)		82 (35.2)	20 (8.6)	1 (0.4)	49 (21.0)	10 (4.3)	233 (100)
Base!wide Misc.	1 (0.8)			87 (68.0)		3 (2.3)			19 (14.8)			18 (14.1)	128 (100)
TOTAL	57 (1.1)	155 (3.1)	287 (5.7)	590 (11.7)	17 (0.38)	186 (3.7)	1,523 (30.2)	548 (10.8)	370 (7.4)	65 (1.3)	1.116 (22.2)	119 (2.4)	5,033 (100)

CM = Community Development

CO = Commercial Development

TABLE 3-6 LIST OF ACTIVE WATER SUPPLY WELLS PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Well ID#	Well ID#	Well ID #
557	662	616
558	698	623
584	699	646
585	700	647
586	701	654
595	703	AS 4150
596	704	BB 44
606	705	BB 47
607	940 Feb. 38 707	LCH 4009
611	708	TC 600
612	709	TC 1253
613	710	
614	711	·
617	5186	
618	AS 190	
619	AS 191	
620	AS-5001	
621	BA 145	
622	BA 164	
627	BA 190	
628	BB 218	
629	BB 220	
632	BB 221	
633	BB 280	
640	BB 281	
643	LCH 4007	
644	TC 1000	
663	TC 1001	
641	TC 604	
642	VL 101	
648	VL-102	
650	VL-103	
652	VL-104	
661	VL-105	

Notes:

Source: MCB, Camp Lejeune, March 2002.

^{*}Shaded wells will soon be replaced

^{*}All Wells are Sampled Once a Year for Volatile Organic Chemicals (VOC's)

^{*}Bold Wells (3rd Column) are Sampled Twice a Year (January and July) for VOC's. These Water Supply Wells are Located Within 1500 Ft. of Known Contaminated Areas

TABLE 3-6 (Cont.) LIST OF ACTIVE WATER SUPPLY WELLS PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

40 CFR 141.61

<u>Maximum Contaminant Levels for Volatile Organic Contaminants</u>

		2L Standards
<u>Contaminant</u>	Maximum Contaminant Level (mg/l) (ppb)	Groundwater (ppb)
p-Isopropyltoluene	N/A	
chloromethane	N/A	N/A
DCDfluormethane	N/A	1,400
Bromomethane	N/A	N/A
Chloroethane	N/A	N/A
Fluorotrichloromethane	N/A	N/A
Hexachlorobutadine	N/A	.44
Napthalene	N/A	21
1,2,4-TChlorobenzene	70	70
c-1,2-Dchloroethylene	70	70
Dibromomethane	N/A	N/A
1,1-Dichloropropene	N/A	N/A
1,3-Dichloropropane	N/A	N/A
1,3-Dichloropropene	N/A	N/A
1,2,3-TChlororopane	N/A	.005
2,2-Dichloropropane	N/A	N/A
1,2,4-TMethylbenzene	N/A	N/A
1,2,3-Tchlorobenzene	N/A	N/A
n-Butylbenzene	N/A	N/A
1,3,5-TMBenzene	N/A	350
tert-Butylbenzene	N/A	70
sec-Butylbenzene	N/A	70
Bromochloromethane	N/A	N/A
Chloroform	N/A	0.19
Bromoform	N/A	0.19
BDChloromethane	N/A	0.60
CDBromomethane	N/A	N/A
o-Chlorotoluene	N/A	N/A
p-Chlorotoluene	N/A	N/A
m-Dichlorobenzene	600	620
p-Dichlorobenzene	75	75
1,1-DCEthane	N/A	700
1,2-Dichloroethane	5	0.38
Carbon Tetrachloride	5	0.30
1,1,2-TCEthane	5	N/A
1,1,1,2-TCEthane	N/A	N/A
1,1,2,2-TCEthane	N/A	0.17
Chlorobenzene	100	100
Ethylbenzene	700	29
Bromobenzene	N/A	N/A
Isopropylbenzene	N/A	N/A
n-Propylbenzene	N/A	N/A
Vinyl chloride	2	.015

TABLE 3-6 (Cont.) LIST OF ACTIVE WATER SUPPLY WELLS PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Maximum Contaminant Level (mg/l) (ppb)	2L Standards Groundwater (ppb)
Benzene	5	5
Trichloroethylene	5	2.80
para-Dichlorobenzene	75	75
1,1-Dichloroethylene	7	7
1,1,1-Trichloroethane	200	200
1,2-Dichloropropane	5	0.56
Ethylbenzene	700	29
Monochlorobenzene	100	N/A
o-Dichlorobenzene	600	620
Styrene	100	100
Tetrachloroethylene	5	0.70
Toluene	1,000	1000
trans-1,2-Dichloroethylene	100	70
Xylenes (total)	10,000	530
Dichloromethane	5	N/A

*N/A Unregulated Contaminants

<u>Maximum Contaminant Levels for Synthetic Organic Contaminants</u> (SOC's)

Contaminant	Maximum Contaminant Level (mg/l) (ppb)
Alachlor	2
Aldicarb	3
Aldicarb sulfoxide	4
Aldicarb sulfone	2
Atazine	3
Carbofuran	40
Chlordane	2
Dibromochloropropane	0.2
2 ,4-D	70
Ethylene dibromide	0.05
Heptachlor	0.4
Heptachlor epoxide	0.2
Lindane	0.2
Methoxychlor	40
Polychlorinated biphenyls	0.5
Pentachlorophenol	The state of the s
Toxaphene	3
2,4,5-TP	50
Benzo[a]pyrene	0.2
Dalapon	200
Di(2-ethylhexyl) adipate	400
Di(2-ethylhexyl) phthalate	6
Dinoseb	- Total Control Contro
Diquat	20
Endothall	100
Endrin	2

TABLE 3-6 (Cont.) LIST OF ACTIVE WATER SUPPLY WELLS PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB CAMP LEJEUNE, NORTH CAROLINA

Contaminant	Maximum Contaminant Level (mg/l) (ppb)			
Gyphosate	700			
Hexachlororbenzene	1			
Hexachlorocyclopentadiene	50			
Oxamyl (Vydate)	200			
E cloram	500			
Simazine	4			
2,37,8-TCDD (Dioxin)	3x10 ⁻⁵			
Dicamba	N/A			

^{*}Camp Lejeune Samples Every Three Years for SOC's

40 CFR 141.62

Maximum Contaminant Levels for Inorganic Contaminants

Contaminant	Maximum Contaminant Level (mg/l) (ppb)
Arsenic	10,000
Fluroide	4,000
Asbestos	7 Million Fibers/Liter
Barium	2,000
Cadmium	5
Chromium	100
Mercury	2
Nitrate	10,000 (as Nitrogen)
Nitrite	1000 (as Nitrogen)
Total Nitrate and Nitrite	10,000 (as Nitrogen)
Selenium	50
Antimony	6
Beryllium	4
Cyanide (as free Cyanide)	200
Thallium	2

40 CFR 141.64

Maximum Contaminant Levels for Disinfection Byproducts

<u>Contaminant</u>	Maximum Contaminant Level (mg/l) (ppb)
Total trihalomethanes (TTHM)	80
Haloacetic acids (five) (HAA5)	60
Bromate	10
Chlorite	1000

Notes:

Source: MCB, Camp Lejeune, March 2002.

^{*}Camp Lejeune Sampled All Online Water Supply Wells and Finished Water (Hadnot, Holcomb Blvd, MCAS, and Courthouse Bay) Twice in 2001 for Highlighted Synthetic Organic Chemicals Using Method 515.1.

TABLE 3-7

SUMMARY OF WATER LEVEL MEASUREMENTS - FEBRUARY 26, 1996 SITE 75, MCAS BASKETBALL COURT AIR STATION PA SITES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

Monitoring Well Number	Top of Casing Elevation (Ft. above msl) ⁽¹⁾	Depth to Groundwater (ft. Below top of casing)	Groundwater Elevation (Ft. above msl) ⁽¹⁾
75-GW01	17.2	6.05	11.15
75-GW02	19.56	7.36	12.2
75-GW03	19.83	7.74	12.09
75-GW04	12.77	3.91	8.86
75-GW05	14.25	4.54	9.71

Notes:

(1) Mean sea level

TABLE 3-8

SUMMARY OF WATER LEVEL MEASUREMENTS - FEBRUARY 26, 1996 SITE 76, MCAS CURTIS ROAD AIR STATION PA SITES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

Monitoring Well Number	Top of Casing Elevation (ft. above msl) ⁽¹⁾	Depth to Groundwater (ft. below top of casing)	Groundwater Elevation (ft. above msl) ⁽¹⁾
76-GW01	18.92	8.31	10.61
76-GW02	10.27	4.31	5.96
76-GW03	12.43	5.28	7.15
76-GW04	16.56	5.36	11.20
76-GW05	16.60	7.67	8.93

Notes:

(1) Mean sea level

TABLE 3-9

SUMMARY OF WATER LEVEL MEASUREMENTS FOR MONITORING WELLS ON DECEMBER 11, 1994, FEBRUARY 3-4, 1995, AND MARCH 27, 1995 OPERABLE UNIT NO. 8 (SITE 16) MONTFORD POINT PA SITES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

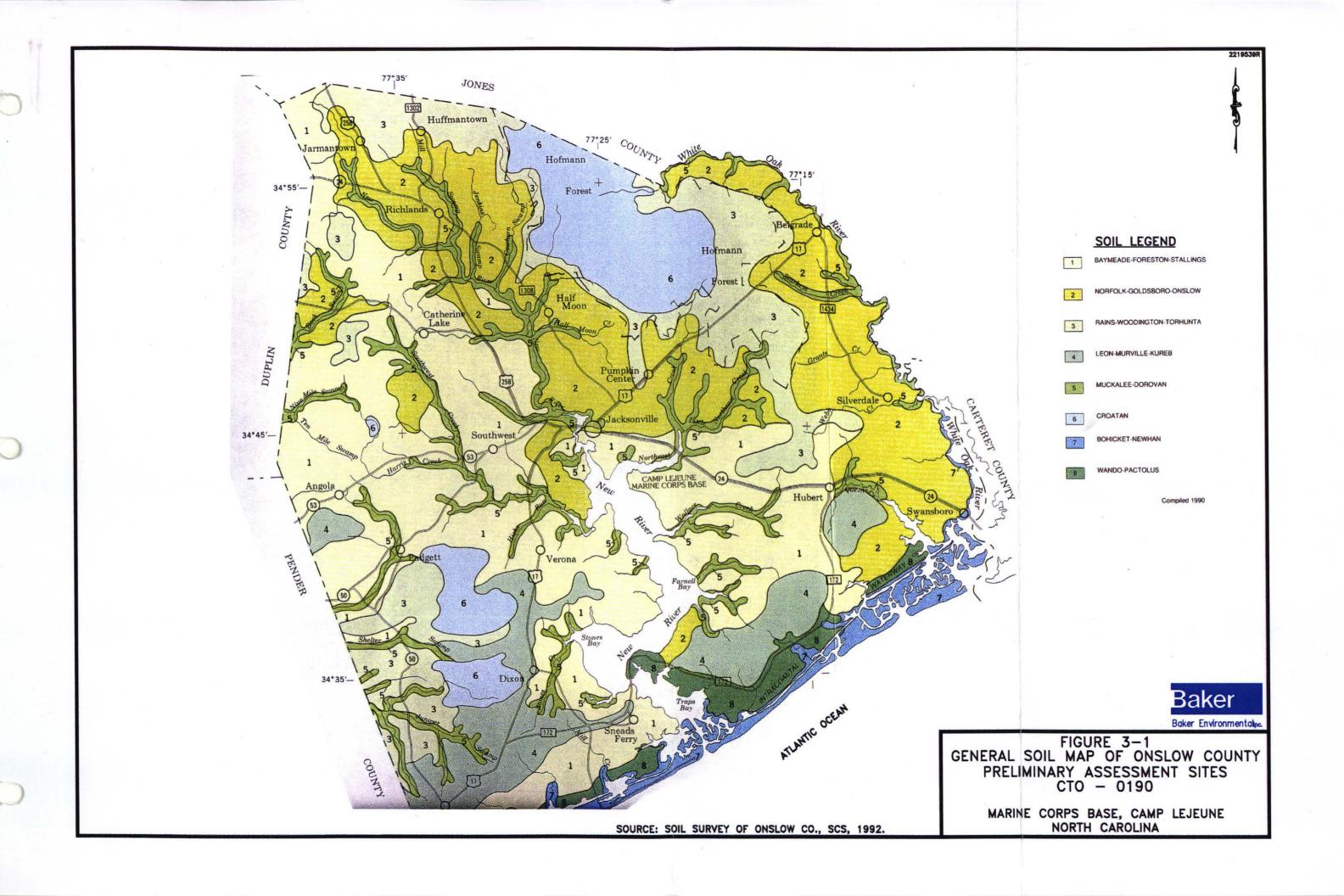
Well No.	Top of PVC Casing Elevation ⁽¹⁾ (feet, above msl)	Depth to Groundwater (feet, below top of casing) (12/11/94)	Groundwater Elevation (feet, above msl) (12/11/94)	Depth to Groundwater (feet, below top of casing) (02/3-4/95)	Groundwater Elevation (feet, above msl) (02/3-4/95)	Depth to Groundwater (feet, below top of casing) (03/27/95)	Groundwater Elevation (feet, above msl) (03/27/95)
16-MW01	19.88	15.61	4.27	13.72	6.16	12.95	6.93
16-MW02	6.76	4.51	2.25	3.9	2.86	3.68	3.08
16-MW03	11.63	10.26	1.37	9.8	1.83	9.87	1.76
16-MW04	12.55	10.89	1.66	10.35	2.2	10.36	2.19
16-MW05	21.28	18.43	2.85	17.22	4.06	16.84	4.44
16-MW06	18.43	15.7	2.73	14.46	3.97	14.16	4.27

TABLE 3-10

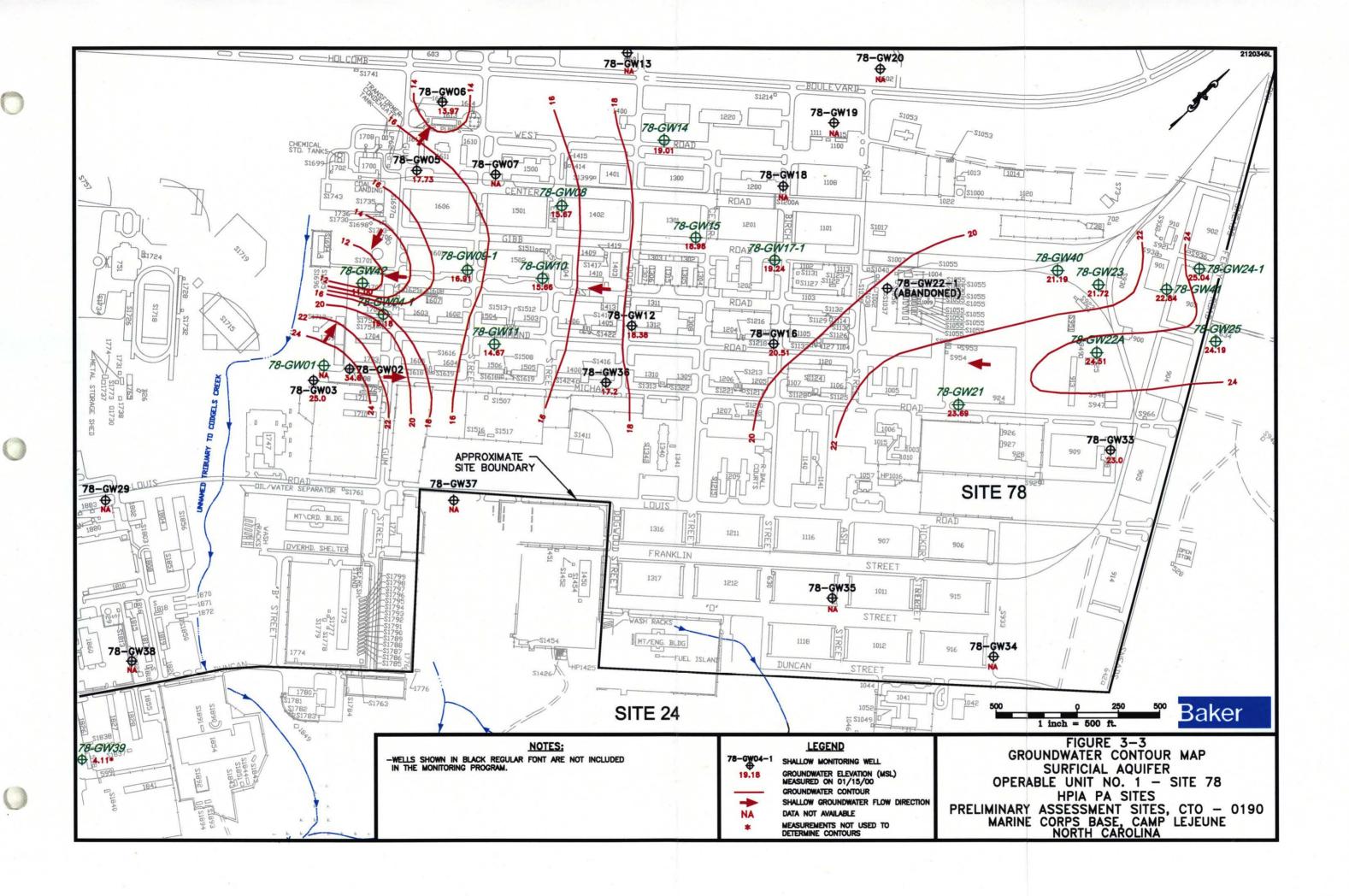
AQUIFER CHARACTERISTICS - MONITORING WELLS OPERABLE UNIT NO. 8 (SITE 16) MONTFORD POINT PA SITES PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

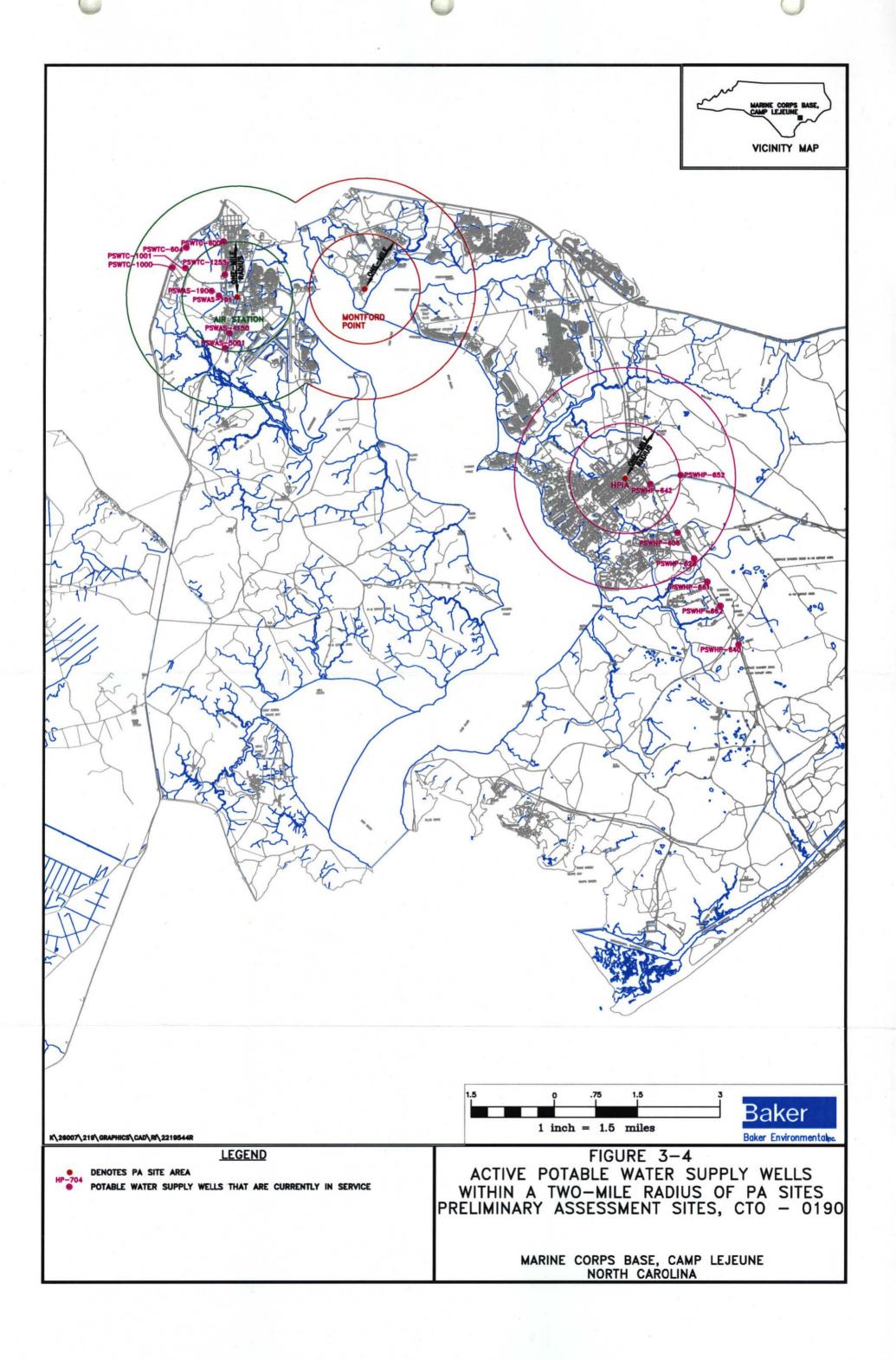
Well No.	Hydraulic Conductivity (K) (feet/day)	Hydraulic Gradient (i) (feet/feet)	Effective Porosity (n)	Groundwater Velocity (V) (feet/day)
16-MW01 (Rising Head)	10.19	0.003	0.35	0.09
16-MW02 (Rising Head)	6.09	0.003	0.35	0.05
16-MW02 (Falling Head)	3.46	0.003	0.35	0.03
16-MW03 (Rising Head)	1.07	0.003	0.35	0.01
16-MW04 (Rising Head)	13.02	0.003	0.35	0.11
16-MW05 (Rising Head)	3.34	0.003	0.35	0.03
16-MW05 (Falling Head)	2.74	0.003	0.35	0.02
16-MW06 (Rising Head)	7.68	0.003	0.35	0.07
16-MW06 (Falling Head)	6.34	0.003	0.35	0.05

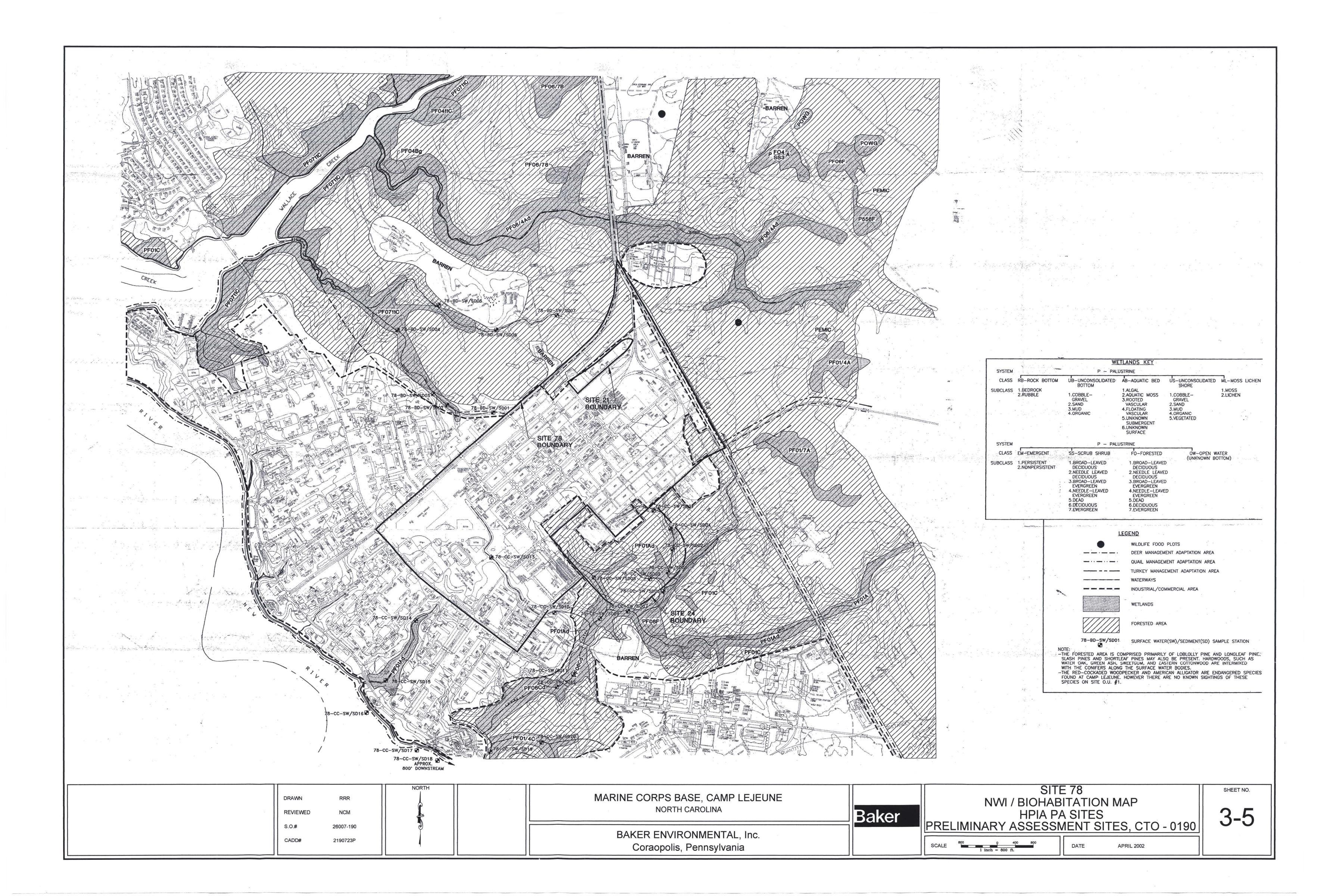


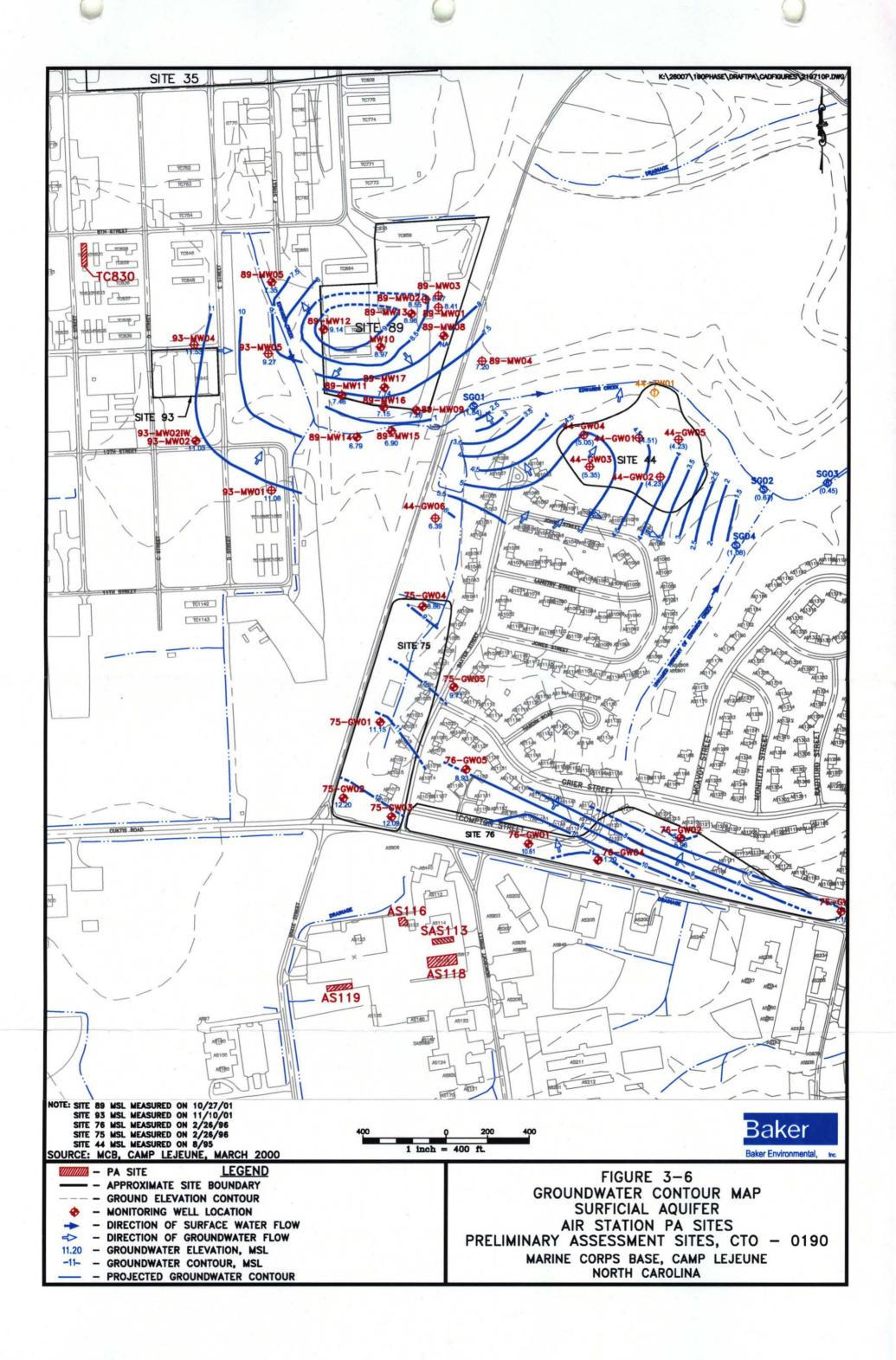


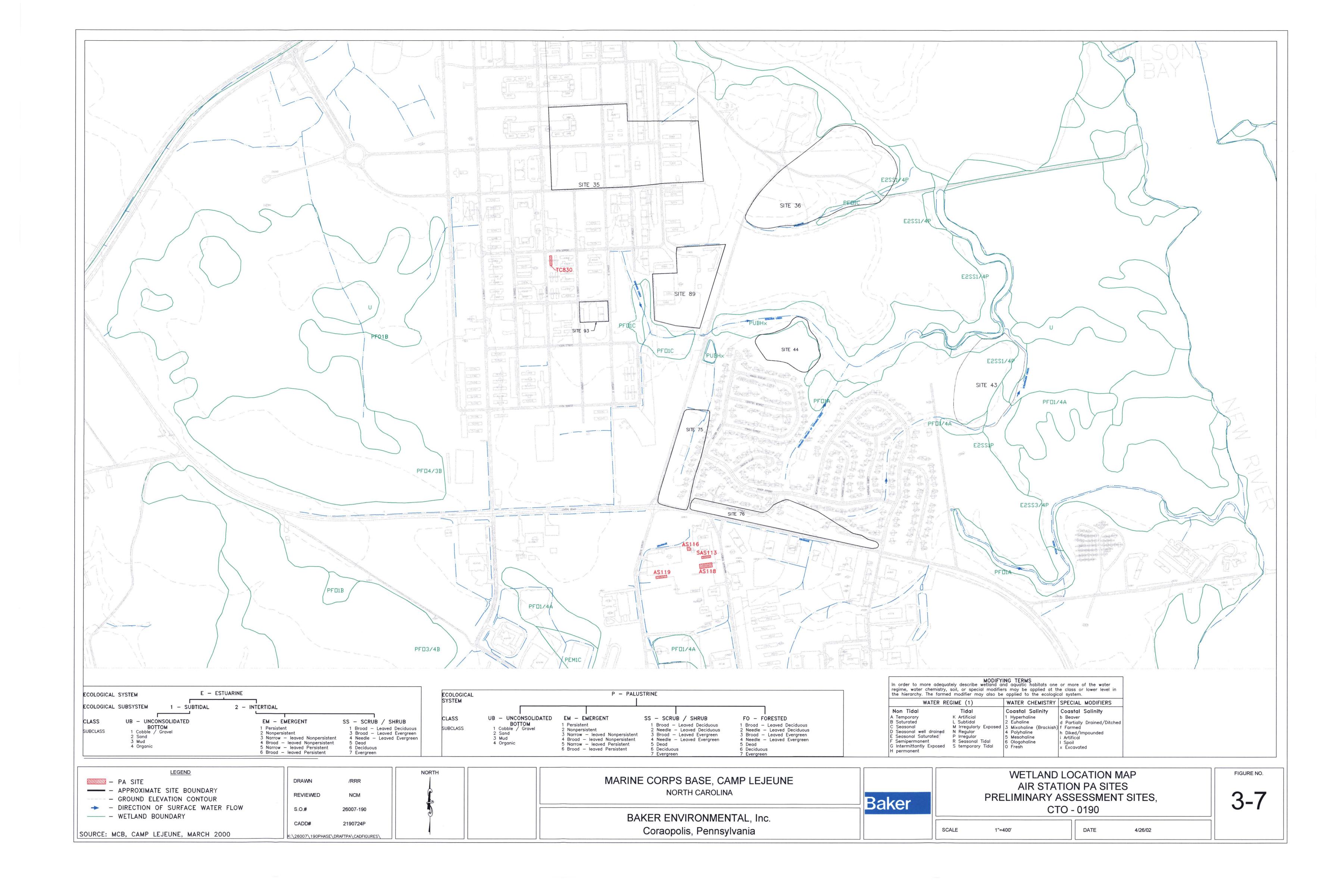


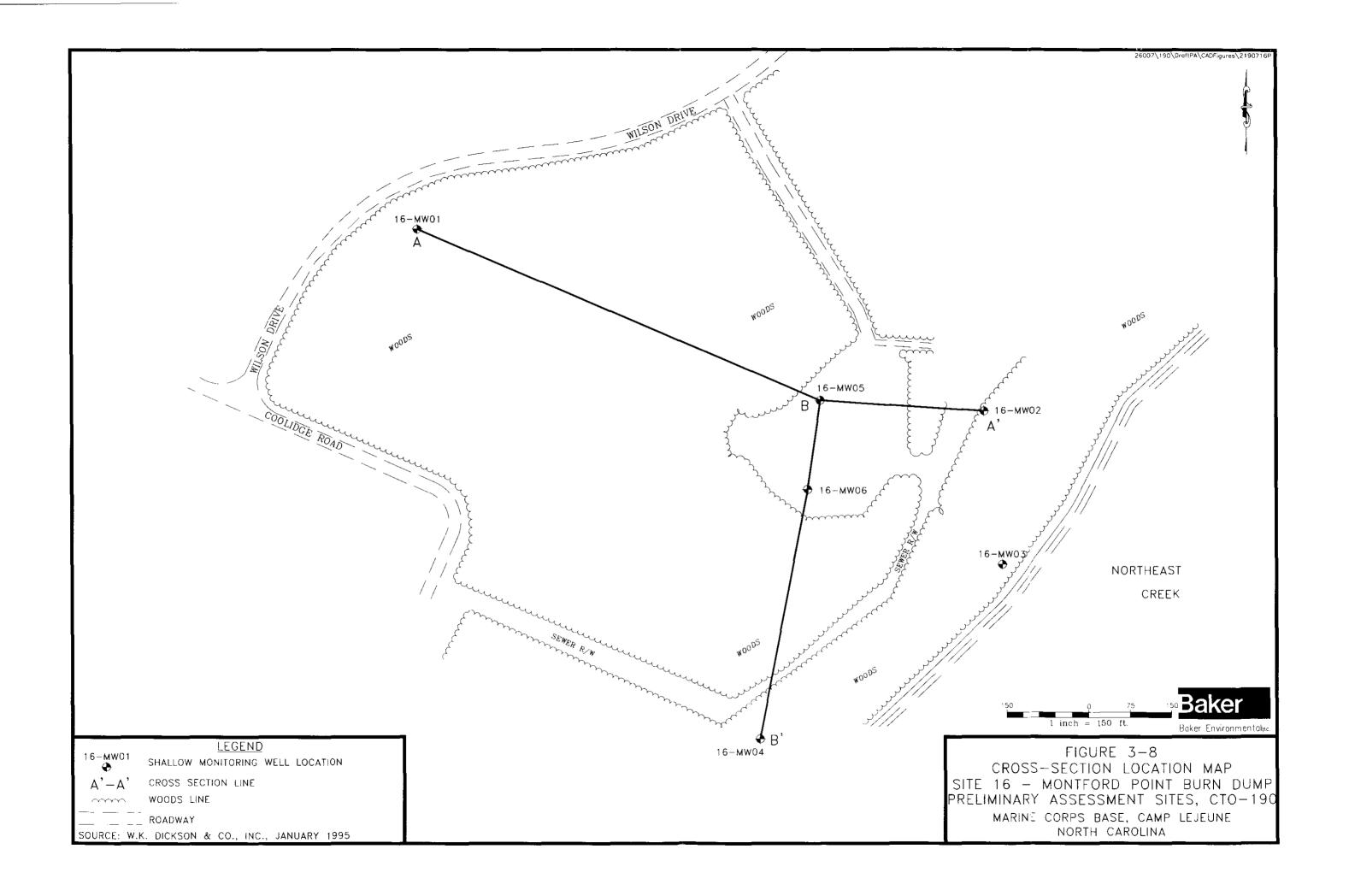


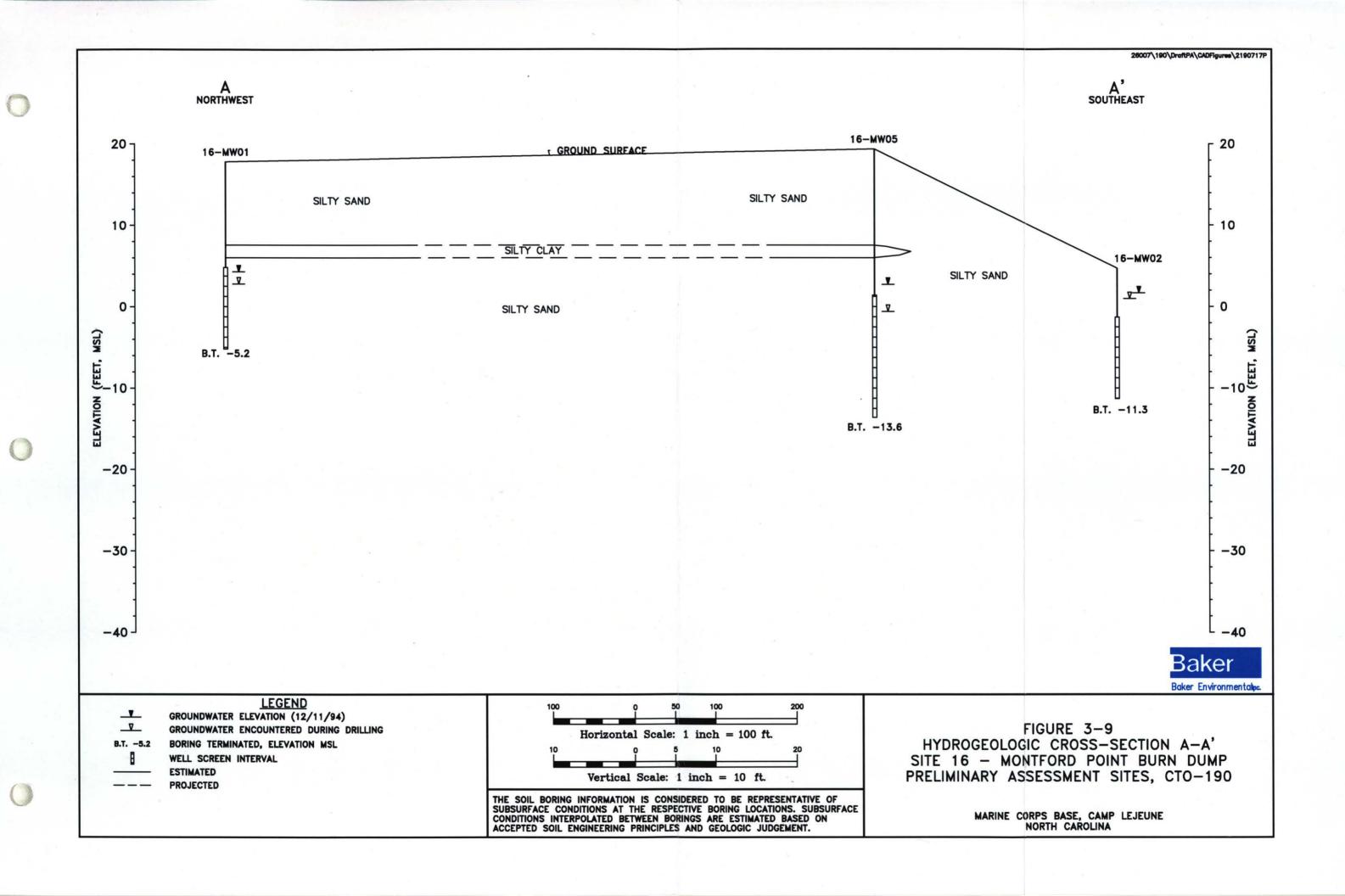


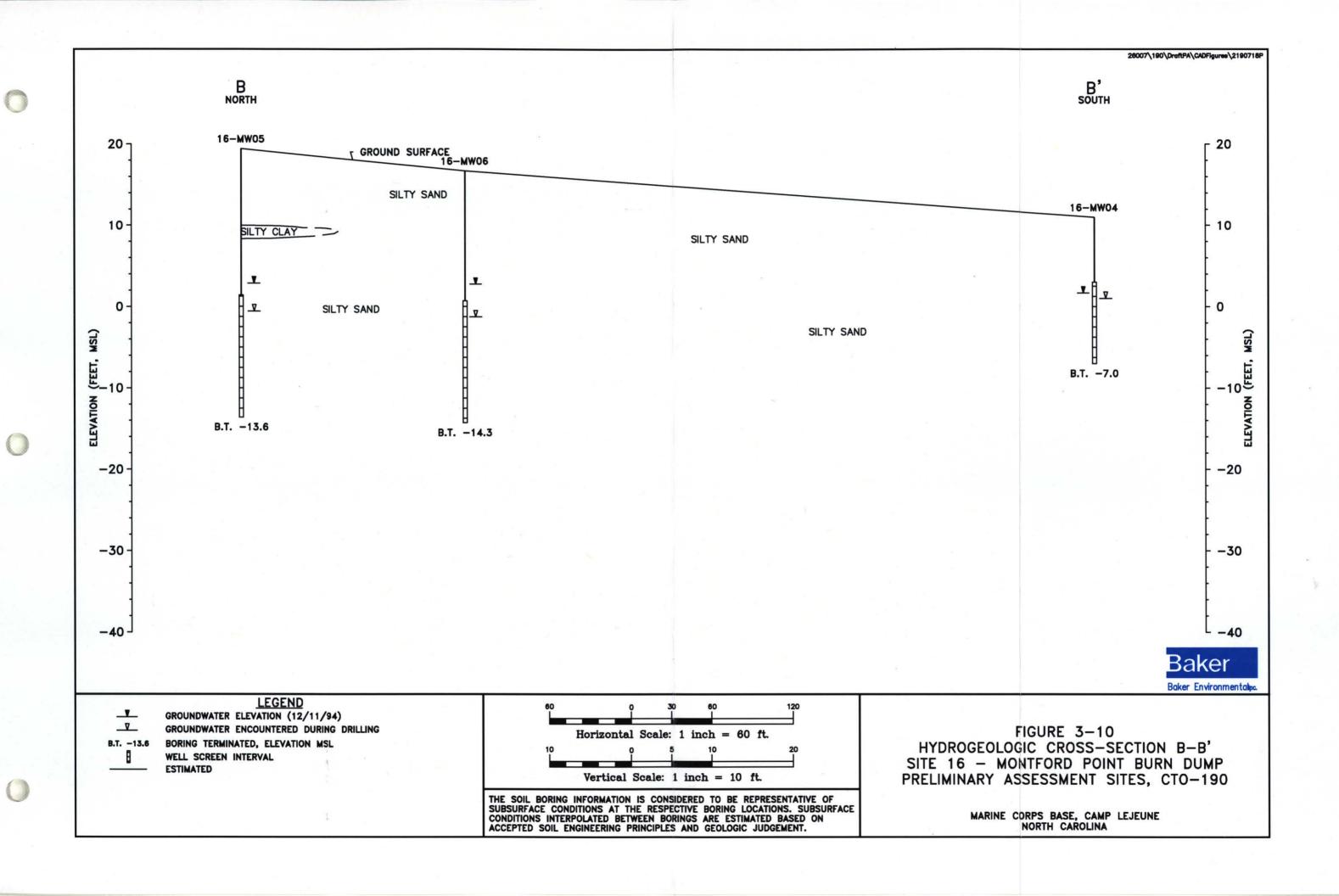


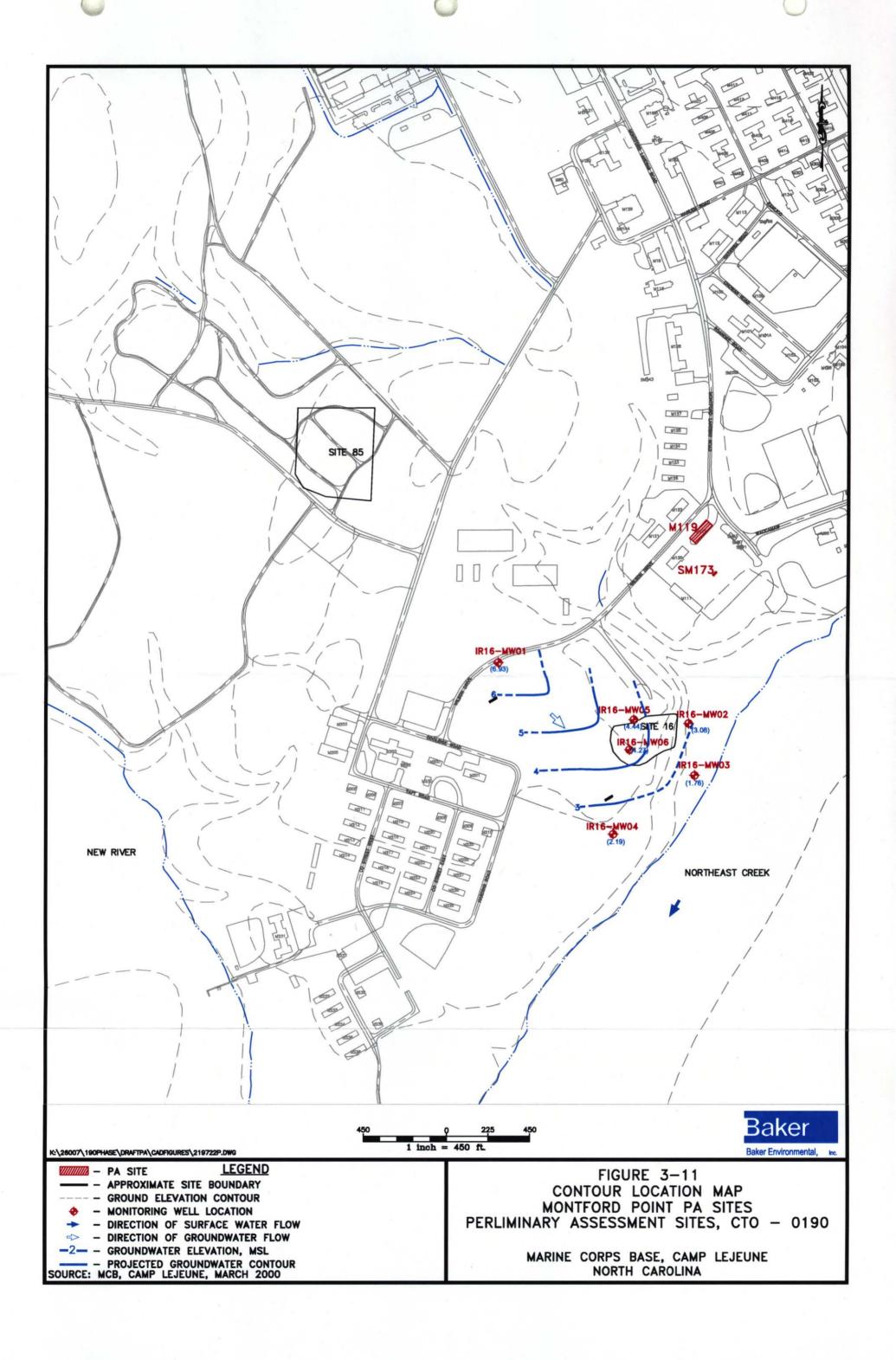


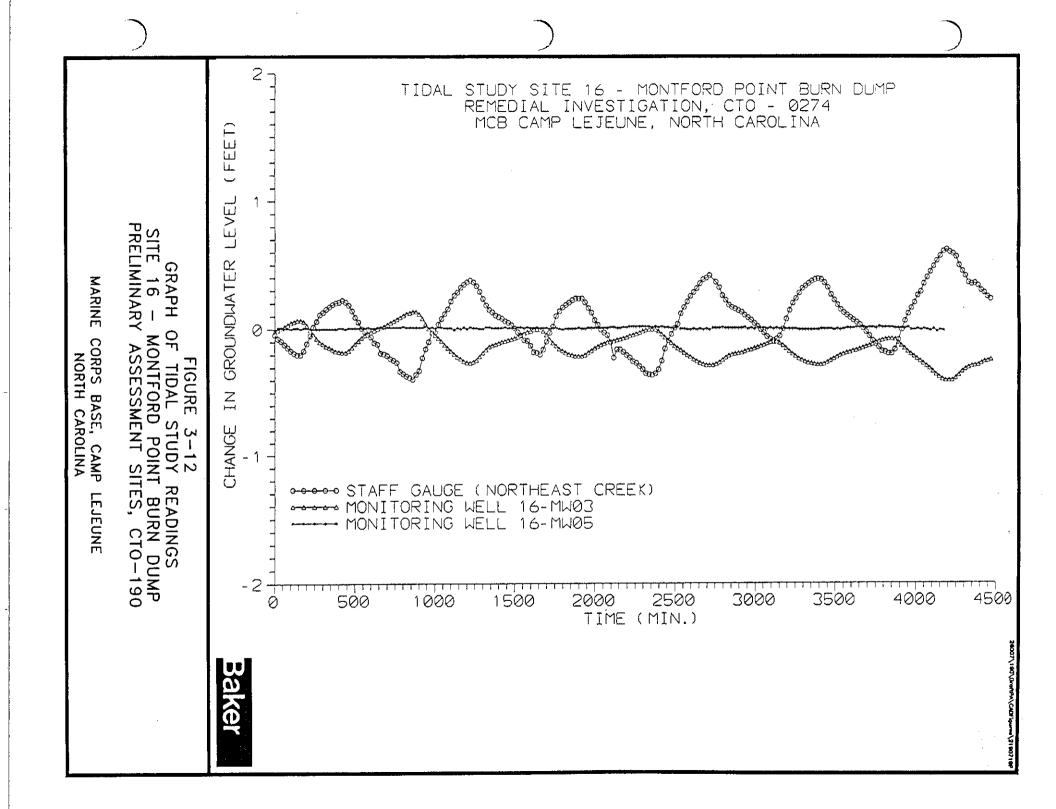


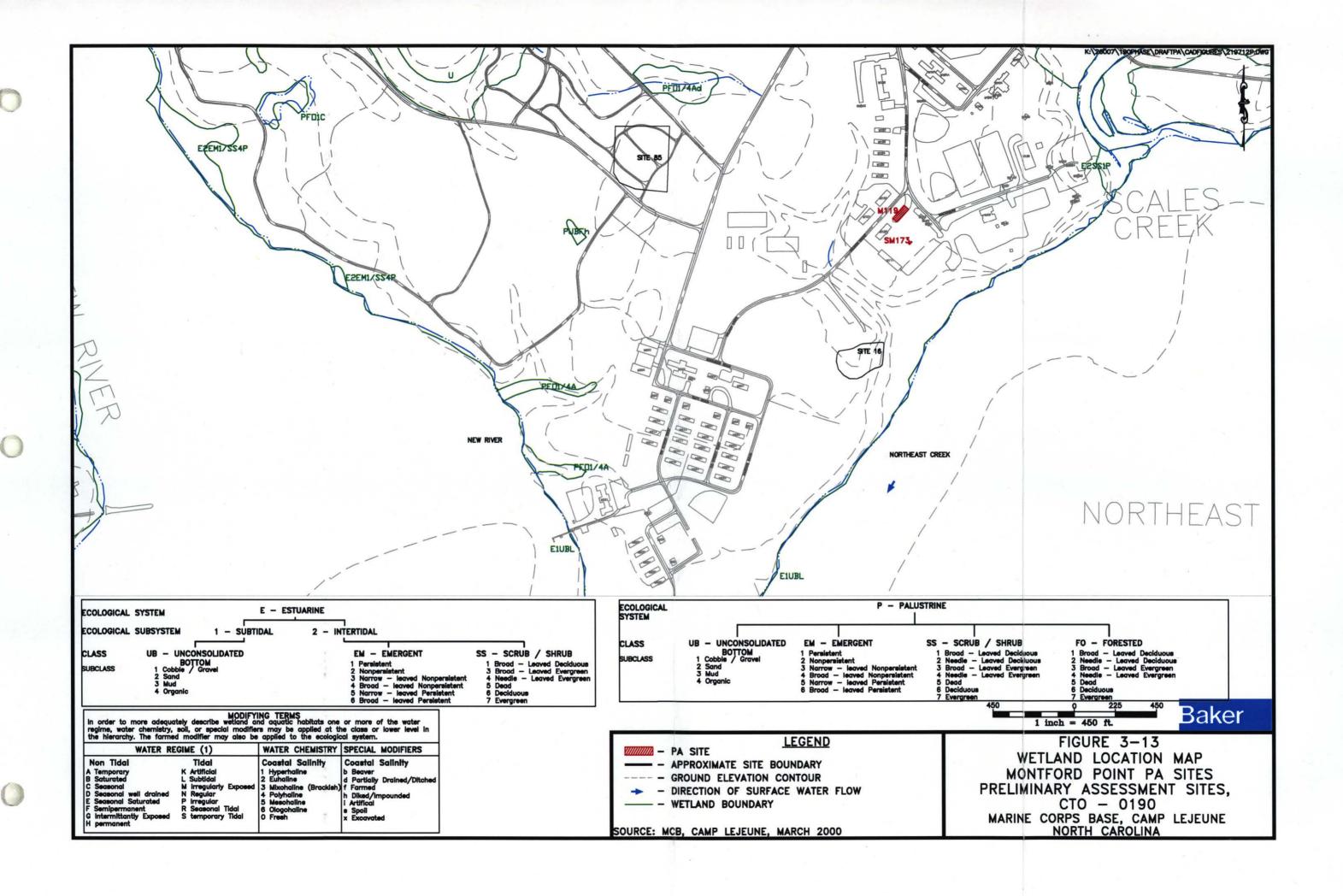












4.0 SUMMARY OF FINDINGS

A preliminary assessment of 12 sites at Camp Lejeune has been completed. Six of the sites are located within OU No. 1 (Site 78) near areas that have been previously investigated through the IR, UST, or SWMU Programs. Four of the sites are located on the Air Station portion of the Base and two of the sites are located in the Montford Point portion of the Base, in areas that have not been previously investigated. The areas of most concern are those that have not been studied previously and/or are not included in an existing OU. The buildings at the Air Station and Montford Point portions of the Base have mainly been used as vehicle repair related facilities. Based on the information as presented in this report and suspected past material and waste handling practices at the Base, these areas have a potential to release hazardous materials to the environment. Detailed information was not found for most of the sites reviewed including wastes generated and waste disposal practices. Much of the basis for identifying the wastes in these facilities is the knowledge of the typical materials and wastes associated with the processes housed in these areas and that they generally contain potential contaminants.

Most of the sites were suspected to have stored solvents and waste oils resulting from operations such as vehicle related repair and storage. Other areas of concern focused on potential contamination from hazardous and flammable materials storage, and paint strippers (mineral spirits, toluene, acetone or MEK).

During the Environmental Literature Review, USTs and ASTs were identified that may have contained waste oils, gasoline or diesel fuel in the area of the PA Sites. A detailed discussion of the ASTs and USTs are included in Appendix C.

To qualitatively evaluate the potential impact of the 12 sites on human health and the environment, information on the regional and local geology, hydrogeology, population, and nearby sensitive environments was gathered and, along with the present site conditions, was evaluated with respect to four potential pathways (migration and exposure): groundwater, surface water, soil and air.

 Groundwater Migration Pathway - Of the four pathways, the groundwater migration exposure pathway has the greatest potential for being affected by contamination originating from the Camp Lejeune PA sites. Since the groundwater table is shallow (typically less then 10 feet below grade), contamination has a relatively limited distance to migrate vertically before reaching the shallow groundwater system. The groundwater in this shallow aquifer is not used for drinking water purposes; therefore, there would not be any primary or secondary targets with this pathway.

The Upper Castle Hayne aquifer is found immediately below the surficial aquifer. However, the separation of the water table and the Castle Hayne is not always obvious. Often, this separation is effected only by the lower permeability material of the surficial water table aquifer transitioning to the significantly more permeable material of the Upper Castle Hayne; there is rarely a distinguishable low permeability unit acting as a aquitard to vertical migration of groundwater. This may increase the risk of contaminants penetrating into the Castle Hayne aquifer, which is the source that supplies the entire Base with potable water.

- Surface Water Migration Pathway Due to the proximity of the PA Sites to the New River and its major tributaries and assumed surface water drainage pathways, the likelihood of release of contaminants to the surface water would have been high at the time of potential hazardous operation at the sites. The outfalls would have contributed various contaminants generated throughout the PA Sites to the surface water. Because the extent and type of contamination has not been determined, it is difficult to speculate whether contaminants could have impacted potential receptors in the past. Presently, the most likely potential surface water contamination is contributed to the surface water through groundwater recharge; however, further information would be needed to determine the potential impacts under this scenario. Since there are no surface water intakes downstream of the PA Sites to create a threat to drinking water, the likely potential targets would be limited to the human food chain through fishing activities, and sensitive environments.
- Soil Exposure Pathway The soil exposure pathway has been exempted for the majority of the areas of concern identified at the PA Sites because asphalt and/or concrete cover the areas. Under CERCLA guidelines, sources with an impenetrable cover, regardless of thickness, are not considered under the soil exposure pathway. This pathway has been considered exempt for all the areas of concern, with the exception of grass or soil covered sections.

• Air Migration Pathway - The significance of the air migration pathway is contingent on whether hazardous substances are likely to be migrating from the sites to the air. Again, due to the extensive surface cover at the majority of the areas of concern and the nature of contaminants at the areas identified as potential migration sites, it is considered unlikely that any hazardous substances could migrate through asphalt and/or concrete to the air.

In conclusion, the pathway of greatest concern is groundwater. Surface water also poses a significant threat as a potential hazardous substance pathway at the Base. Soil and air are less likely to serve as pathways for contaminants at the Camp Lejeune PA Sites.

Analytical data to document evidence of releases and exposure of targets were not available for review. Therefore, historical and accessible information as well as professional judgment were relied upon to develop the hypotheses within this report.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the data collected and evaluated for the 12 sites of concern identified throughout the Base, the present condition of the sites indicates that there should be little, if any, impact on the people living on and working in the areas evaluated. However, CERCLA guidelines emphasize the need to exercise conservative judgment with respect to additional investigations in the absence of definitive proof concerning the nature and extent of potential contamination associated with any of the sites. Because information is not known for the majority of the sites about the possible types and or extent of contamination, initial field investigation activities should be completed at the following seven sites:

HPIA

- Building HP1120
- Building HP1409
- Former Building HP1512

Air Station

- Building SAS113
- Building AS116
- Building AS119

Montford Point

• Building M119

Field investigation activities might include as appropriate:

- Collection and analysis of surface and subsurface soil samples to assess whether soils contain contamination.
- Collection and analysis of groundwater samples to determine if local groundwater quality has been affected by past site operations.

The field investigation activities would be limited to the identified areas of concern. The information obtained during a field investigation would aid in confirming the presence or absence of contamination and to confirm the identified migration and exposure pathways.

Investigations into these sites should also direct any non-CERCLA issues to the appropriate RCRA regulatory programs as identified in Appendix C.

The following discussion provides the conclusions and recommendations for the 12 sites studied. Conclusions and recommendations are based on the information presented throughout this PA Report, including the operational history and waste assessment, and pathway and environmental hazard assessment.

5.1 HPIA Sites

5.1.1 Building HP902

Based on the findings of previous investigations, building HP902 has been thoroughly assessed through numerous investigations as mentioned previously and does not warrant additional investigation. As presented in Appendix F, a former UST containing TCE was determined near Building HP903. Currently, a pump and treat system and a LTM program are in place in this area of contamination as stipulated in the ROD for OU No. 1 (Baker, September 1994). Investigations performed in this area include a soil gas investigation, soil borings analyzed during both the CS and the RI, a geophysical investigation, and installation and sampling of monitoring wells and recovery wells.

5.1.2 Building HP908

Further investigations are not warranted for Building HP908. Based on the analytical results from the RI (Baker, June 1994) as presented in Appendix F, the area of Building HP908 was determined not to contain VOCs, SVOCs, PCBs, or pesticides. Studies performed during the RI at Building HP908 include a soil gas investigation, soil boring analyses, and monitoring well installation and sampling.

5.1.3 Building HP1120

Building HP1120 may be a source of potential contamination based on past use and previous disposal practices at the Base. Building HP1120 has been used as an Auto Hobby Shop since the 1950s. Known wastes used or stored in this building include automotive grease, oil, waste oils, and paint. There is also an AST in this building that may contain waste oil. No known investigations have been performed at Building HP1120. During the site visit a hazardous waste storage structure was identified near this building and Building HP1124 in the parking lot. From the picture there is evidence of staining. It is recommended that Building HP1120 and the associated AST and hazardous waste structure be studied further to determine possible contamination surrounding this area.

5.1.4 Building HP1124

Investigations through the SWMU program determined that the AST in Building HP1124 would not require further investigations; however, temporary wells are currently being installed (March/April 2002) near the oil/water separator at Building 1107. Based on the current findings of the SWMU program, as provided in Appendix H.1, Building HP1124 does not require further investigation. If, however, contaminants are identified from the on-going SWMU investigation, future actions may be warranted through the RCRA Program.

5.1.5 Building HP1409

It is recommended that the area surrounding Building HP1409 and the area of the 550 gallon vat of paint stripper and the random AST storage area, be further investigated to determine potential contamination. Building HP1409 was constructed in the 1940s and has been used as a upholstery and carpentry shop, a decontamination building, a storage building, and a furniture repair shop. Painting was also conducted at this building and a number of wastes including paint stripper, hydraulic fluid, penetrating fluid, and gear case oil have been used or stored here. There is a 550 gallon vat of paint stripper that was used or may still be used in this building. Paint stripping chemicals can include any of the following products: mineral spirits, toluene, MEK, or acetone. There are no known investigations that have been performed at Building HP1409, although a number of investigations have been performed at neighboring buildings southwest of Building HP1409. During the site visit a number of ASTs and containers were identified adjacent to

Building HP1409 as shown in Appendix B, Photo 26. The contents and capacity of these ASTs and containers are unknown.

5.1.6 Building HP1512

It is recommended that former Building HP1512 require further investigations to determine if contamination exists. Information for the former structure HP1512 is unknown. No records have been found to document the operational history of the building. It is assumed that this former structure was used as a vehicle support structure. There are also no known waste characteristics for this structure. No known pervious samples have been collected in the area of the former Building HP1512, except for groundwater from monitoring well IR78-GW11 that is located across Hammond Street. Lack of information of this former structure leaves unanswered questions concerning types of wastes that may have been generated, used, or diposed of in this area.

5.2 Air Station Sites

5.2.1 Building TC830

TC830 is not recommended for further investigation. No information was found during the Environmental Literature Review or field reconnaissance to indicate that any hazardous wastes were used or disposed of at Building TC830. The Environmental Literature Review verified that this facility did not perform dry cleaning operations, and therefore, dry cleaning chemicals are not suspected at this building.

5.2.2 Building SAS113

Based on the lack of information and the known operations (vehicle repair) performed in this building it is recommended that Building SAS113 requires further investigation to determine if contamination exists. Records of chemicals/compounds used or stored in Building SAS113 were not found during the Environmental Literature Review. Since this is a vehicle support area, it is suspected that nay number of automobile repair wastes are used or stored here and may include the following: paints, paint thinners, waste oil, antifreeze, parts cleaning wastes (solvents and parts washers), automotive batteries, and shop cleaning wastes (floor cleaning wastes, absorbents used for spills or leaks and shop rags). The waste disposal practices are also unknown at this

structure. No known investigations have been performed at Building SAS113. Lack of information for Building SAS113 leaves unanswered questions concerning types of wastes that may have been generated, used, or disposed of in this area.

5.2.3 Building AS116

Based on the lack of information and the known operations (vehicle repair, painting, hazardous and flammable storage) that were performed in this building it is recommended that Building AS116 require further investigations to determine if contamination exits. Records of chemical/compounds used or stored in Building AS116 were not found during the Environmental Literature Review. Since this is a vehicle support area, it is suspected that any number of automobile repair wastes are used or stored here and may include the following: waste oil, antifreeze, parts cleaning wastes (solvents and parts washers), automotive batteries, and shop cleaning wastes (floor cleaning wastes, absorbents used for spills or leaks and shop rags). This building is also listed as a paint shop and may include the following wastes associated with painting: paint thinners (mineral spirits, toluene, MEK or acetone) and waste paint.

In addition to supplying vehicle support, this area was also used to store hazardous and flammable materials. There are no records of the types of hazardous and flammable materials stored in Building AS116. The waste disposal practices are also unknown at Building AS116. No known investigations have been performed at Building AS116. Lack of information for Building AS116 leaves unanswered questions concerning types of wastes that may have been generated, used, or disposed of in this area.

5.2.4 Building AS119

Based on the lack of information and the known operations (vehicle repair) that were performed in this building it is recommended that Building AS119 require further investigations to determine if contamination exists. Records of chemicals/compounds used or stored in Building AS119 were not found during the Environmental Literature Review. Since this is a vehicle support area it is suspected that any number of automobile repair wastes are used or stored in this building and may include the following: paint, paint thinners, waste oil, antifreeze, parts cleaning wastes (solvents and parts washers), automotive batteries, and shop cleaning wastes (floor cleaning wastes, absorbents used for spills or leaks and shop rags). Lack of information for

Building AS119 leaves unanswered questions concerning types of wastes that my have been generated, used, or disposed of in this area.

5.3 <u>Montford Point Sites</u>

5.3.1 Building M119

Based on the amount of potential contaminants that were used at Building M119, it is recommended that this building be investigated further to determine if contamination exists from past operations. Known chemicals/compounds that were used or stored in Building M119 include solvents, waste oils, gasoline, and vehicle repair related materials.

Potential vehicle repair related materials used or stored at this building may include paint and paint thinners, parts cleaning wastes (solvents and parts washers), automotive batteries, automotive oils, and shop cleaning wastes (floor cleaning wastes, absorbents used for spills or leaks and shop rags). Potential gun preservation materials may have also been used at this building during the time the building served as a gun storage area.

Known disposal practices with estimated waste quantities are listed on Table 2-18. As shown, the records indicated that in 1945 trash was collected Base wide (general refuse) daily and hauled to incinerators or open burn dumps. Waste oils (including solvents) were sprayed on unimproved roads on the Base, and solvents used in Building M119 were disposed of via the Safety Kleen Company. In addition, waste oils from both Buildings M119 and M120 were deposited into a UST at an estimated rate of 2,045 gallons annually. A gasoline spill was reported in 1975 when a UST at this building overflowed, and was subsequently cleaned by Base Maintenance personnel (refer to Appendix F.13 for a copy of the spill report). Recommendations regarding the waste oil UST and the fuel oil ASTs that are used to heat the building are included in Appendix C.

5.3.2 Building SM173

It is recommended that since the area of former structure SM173 is currently under investigation through the SWMU program, further investigation through the IR program are not warranted. Former Building SM173 was a small shed that was constructed in 1962 and was used to house a Steam Jenny. Currently, there is a vehicle wash rack and an oil/water separator in this area that is being investigated through the SWMU program as presented in Appendix H, SM173.

6.0 PA SITES FIELD INVESTIGATION

Based on the conclusions and recommendations of this Report, it was decided by the MCB, Camp Lejeune Partnering Team at the April 2002 Partnering meeting to further investigate the HPIA PA Sites (Buildings 1120, 1409 and 1512) during a field investigation at Site 78 that was performed in June 2002. Likewise, the Partnering Team decided at the April 2004 meeting to further investigate the Air Station and Montford Point PA Sites (SAS113, AS116, AS119, M119, and M315). Building M315 was added as a site to be investigated since it was thought that the facility operated as a dry cleaner. No records were found to indicate dry cleaner operations; however, the building was used as a laundry pick up facility until around the 1980s. It was also decided to document the findings of the PA Sites investigation within this PA/SI Report. The objectives of the Partnering Team were met and used to guide the investigation, including identification of locations for sampling and laboratory analytical parameters.

The PA Sites field investigation activities consisted of a soil and groundwater investigation. The focus of the investigation was in the soil and groundwater immediately adjacent to Buildings 1120, 1409 and 1512 within the HPIA; Buildings SAS113, AS116, and AS119 within the Air Station; and M119 and M315 within Montford Point. Field activities were conducted over two field events. The HPIA field event took place from July 1 to 2, 2002, while the Air Station and Montford Point field activities took place June 7 to 11, 2004. The following sections detail the field investigation activities and the findings of the analytical data.

6.1 <u>Surface and Subsurface Soil Investigation</u>

HPIA

The HPIA PA Sites soil investigation within Site 78 consisted of direct push sampling using the Geoprobe® sampling system. Soil samples were collected using a "Macro-Core sampler", a 48-inch long, stainless-steel tube with a 2-inch outside diameter. A 1-1/2-inch inside diameter cutting shoe is threaded to the base of the tube. The macro-core soil samples were collected in a 45-inch long by 1-1/2-inch diameter acetate liner that is inserted into the tube. Soil samples were collected near the water table using the "Macro-Core sampler" and acetate sleeves.

Soil samples were collected from 9 soil borings (3 borings around each building). From each soil boring, samples were collected from two intervals from approximately 0-3 ft and 7-10 ft bgs as

shown on Table 6-1. Soil samples were sent to a fixed base laboratory and analyzed for TCL VOCs, SVOCs, and TAL metals in accordance with Contract Laboratory Protocol (CLP).

Air Station and Montford Point

The soil investigation at the Air Station and Montford Point PA Sites consisted of direct push technology (DPT) using the Geoprobe® sampling system as described above. Soil samples were collected using the "Macro-Core sampler" and acetate sleeves. Soil samples were collected from four soil borings at each PA Site (one boring on each side of the subject building). Samples were collected from each soil boring in the vadose zone from approximately 0-4 ft bgs as listed in Table 6-1 and sent to a fixed base laboratory for TCL VOC, TCL SVOC, TAL metals, and TCL pesticides/PCBs analyses.

6.2 Groundwater Investigation

HPIA

A groundwater investigation was also performed at the three HPIA PA Sites (Buildings 1120, 1409 and 1512) to assess the presence or absence of contamination in the aquifer, which may have resulted from past site activities. The activities associated with the groundwater investigation included temporary monitoring well installation and groundwater sampling.

Nine temporary monitoring wells were installed at the same locations as the Geoprobe® soil borings. The temporary wells were constructed utilizing a 10 foot screen length which was installed to an approximate depth of 30 feet bgs. The wells were constructed using a 2-inch diameter, schedule 40 polyvinyl chloride (PVC) riser and screen (0.01-inch slots).

Groundwater samples were obtained using USEPA Region IV's low flow purging and sampling technique. This technique requires that the groundwater be purged at less than 0.33 gpm by means of either a submersible or peristaltic pump. In this case, Baker personnel utilized a peristaltic pump system. A dedicated length of polyethylene tubing was used for each well sampled. This tubing was disposed following completion of well sampling activities. While the well was being purged, pH, conductivity, temperature and turbidity measurements were obtained. Water quality data are provided on Table 6-2. Once water quality readings (excluding turbidity) stabilized (i.e., two consecutive readings within 10% of each other), a groundwater sample was collected at the same flow rate used for the well purge. Groundwater samples were sent to a fixed base laboratory and analyzed for TCL VOCs, SVOCs, and TAL metals in accordance with CLP as shown on Table 6-3.

Air Station and Montford Point

During the June 2004 field event, a groundwater investigation was also conducted at the Air Station and Montford Point PA Sites. The sample locations were the same as the locations sampled for the soil investigation. Discrete groundwater samples were collected by directly advancing the DPT rod into the water table to a depth of approximately 10 ft bgs at each sample location and extracting samples through a "retractable" screen. Samples were collected with new, clean polyethylene tubing at each sample location utilizing a peristaltic pump. Groundwater samples were sent to a fixed base laboratory and analyzed for TCL VOCs, SVOCs, pesticides/PCBs, and TAL metals in accordance with CLP as shown on Table 6-3.

Nature and Extent of Contamination

This section presents the results of the PA Sites field investigation at the HPIA, Air Station, and Montford Point. The objectives of this section are to confirm the presence or absence of contamination at Buildings 1120, 1409 and 1512 within Site 78; Buildings SAS113, AS116, and AS119 within the Air Station; and M119 and M315 within Montford Point. The positive detection summary tables and detection figures referenced in the text are presented at the end of Section 6.0. A complete summary of the analytical data is included in Appendix K.

6.3.1 Data Quality and QA/QC

Analytical data generated during the PA Sites Field Investigation were submitted for third-party validation to Environmental Data Services, Inc. of Concord, New Hampshire.

Three trip blanks were prepared during the HPIA soil and groundwater investigation. Concentrations of methylene chloride and styrene were detected in the trip blank samples, however no environmental samples had any detections of either methylene chloride or styrene. Six trip blanks were prepared during the June 2004 investigation at the Air Station and Montford Point sites; there were no detections of VOCs, SVOCs, pesticides, PCBs, or total metals. Laboratory analytical results for the trip blanks are included in Appendix K.

6.3.2 Non-Site Related Analytical Results

Many inorganic constituents detected in the soil and groundwater at the PA Sites can be attributed to non-site related conditions or activities. The primary source of non-site related results include naturally occurring inorganic elements. In addition, non-site related operational activities and conditions might contribute to "on-site" contamination. A discussion of naturally occurring inorganic elements is included below.

6.3.2.1 Naturally-Occurring Inorganic Elements

To differentiate inorganic contamination due to site operations from naturally occurring inorganic elements in site media, the results of the sample analyses were compared to information regarding background conditions at MCB, Camp Lejeune. The Final Base Background Study Report for Soil prepared for MCB Camp Lejeune, North Carolina was used for comparison of soil environmental samples collected at the PA Sites to the background metals in soil in this report (Baker, 2001). The Draft Base Background Study Report for Groundwater for MCB, Camp Lejeune, North Carolina was used for comparison of groundwater samples collected at the PA Sites to the background metals in groundwater in this report (Baker, August 2002).

A brief discussion of background sample set and comparison criteria are discussed in the paragraphs that follow. The Final Base Background Study Report for Soil (Baker 2001) and the Draft Base Background Study for Groundwater (Baker, August 2002) present the complete details on the rationale of choosing background sample locations, method of collection and detailed discussions of analytical results.

The base background soil analytical data was divided into five categories based on soil type and depth of sample interval. These categories include surface soil fine sands, surface soil loams, subsurface soil sand, subsurface soil silt, and subsurface soil clay. Different soil types can exhibit different concentrations of inorganic compounds. The purpose of these divisions was to compare data sets of similar soil types. Surface and subsurface soils of different soil types have properties that effect ion attraction and retention. Typically clays exhibit higher inorganic concentrations. The soil samples taken at the PA Sites were compared to the base background numbers by sample depth with an average of the soil types for each surface and subsurface samples, since soil lithography is not documented for the soil samples collected at the PA Sites, and the known soils

at Site 78 tend to vary from fine sands to loamy fine sands in the surface soil and silty sands and clays in the subsurface soil.

The base background groundwater analytical data was divided into two categories based on the depth of the groundwater sample interval. The two categories are shallow groundwater (10-25 ft bgs) and deep groundwater (20 to 42 ft bgs). Different aquifer characteristics can exhibit different concentrations of inorganic compounds. The purpose of these two divisions was to compare data sets of similar aquifer types. Shallow groundwater and deep groundwater have properties that effect ion attraction and retention (similar to the above paragraph for soils). The groundwater samples taken at the HPIA PA Sites were compared to the base background numbers for the deep groundwater, since the temporary monitoring wells were screened at depths of 30 ft bgs. The groundwater data from the Air Stations and Montford Point sites were compared to the base background numbers for the shallow groundwater since samples were collected at depths ranging from approximately 6 to 20 ft bgs.

Tables 6-4 (surface soil), 6-5 (subsurface soil), 6-6 (shallow groundwater), and 6-7 (deep groundwater) show ranges of detections, and statistical summaries including the arithmetic mean (including half non-detections), and the base background mean plus two standard deviations.

For the HPIA PA Sites, only the inorganics with concentrations exceeding the base background maximum detection will be considered for further evaluation.

6.3.2.2 Background Comparison Tests

For the Air Station and Montford Point PA Sites, a statistical analysis was conducted in addition to a straight comparison to the base background data. Two background comparison tests were run for the inorganic surface soil data. These were aimed at addressing two different questions. One, are the elevated site values unlikely to have come from a population equivalent to background? Two, is the center of the site population significantly higher than the background populations? While there is obviously some correlation between these two comparisons, there can also be differing conclusions from them.

For instance, one or more elevated site values might appear unusual relative to background, but the bulk of the site concentrations appear equivalent to background. Or, there might be a significant shift in the center of the site population, relative to background, but none of the individual site concentrations appear unusual relative to background. Both of these situations occur in the Camp Lejeune comparisons.

Individual Comparison to Background

The comparisons of individual site concentrations have been made to background threshold values (BTVs) established by Baker (2001). The results of these comparisons are shown in Appendix L. Each table represents comparisons for an individual Air Station or Montford Point PA Site. The results of two comparisons are shown, one includes detects versus the BTVs while the other includes detection limits for non-detected cases versus the BTVs. Only six total exceedances are noted (calcium and manganese from SAS113, cadmium from AS119, barium from M119, and arsenic and lead from M315).

To put any of these exceedances in perspective it is useful to refer to plots of the data and results of the statistical comparisons of the centers of the site and background populations. Scatter plots of the data are shown in Appendix L. In these plots, detected concentrations are shown as shaded circles while non-detect proxies (½ the detection limit) are shown as open circles. Frequencies of detections for the background and site data are also provided (at the top of the plots).

Central Tendency Comparison to Background

The comparisons of central tendency were applied using the Wilcoxon Rank Sum (WRS) test. This test is a nonparametric test used for estimating whether a difference exists between two populations. The WRS tests whether measurements from one population consistently tend to be larger (or smaller) than those from the other population. Such a nonparametric test is suggested when the sample size is less than 20, which is the case in this comparison where the number of site samples is four (EPA, 2002). As a nonparametric test based on ranks of the data, it is less influenced by spurious results in either data set than parametric tests, such as the t-test, which make a distributional assumption about the data.

When one is interested only if one of the two populations exceeds the other (such as whether site concentrations exceed background) then the WRS test is performed as a one-tailed test. This test calculates the probability that the observed differences between the site and background populations are due merely to random variability in the data, as opposed to the site data actually being shifted higher than the background. If this probability is less than a chosen significance level, say 0.05, then the decision is made that a significant difference does exist between the two populations. A significance level of 0.05, for instance, implies that one has 95% confidence ([1 – 0.05]*100%) that the two groups will be accepted to be statistically equivalent when they actually are.

The WRS test was applied to comparisons between site data and background data for soil data collected at the Air Station and Montford Point PA Sites (shown in Appendix L). The number of available site samples (four) puts limitations on the interpretation of these results, but they are nevertheless offered as an accompaniment to the comparison to BTVs and the scatter plots. In general, these comparisons indicate few background exceedances with surface soil (eight in total). These were for calcium (in the five Air Station and Montford Point PA Sites), cadmium and magnesium (in Building AS119), and lead (in M315). Interestingly, three of these cases (calcium in SAS113, cadmium in AS119, and lead in M315) were also noted with BTV exceedances.

Comparisons of the background values to the environmental samples for the surface and subsurface soil, and shallow groundwater are discussed in Section 6.4.

6.3.3 State and Federal Criteria and Standards

Contaminant concentrations were also compared to contaminant-specific established State and Federal criteria and standards such as Maximum Contaminant Levels (MCLs) or Ambient Water Quality Criteria (AWQC).

The only enforceable federal regulatory standards for groundwater are the Federal MCLs. In addition to the federal standards, the State of North Carolina has developed the North Carolina Water Quality Standards (NCWQS) for groundwater. The State also has soil quality criteria designed to prevent groundwater contamination. These criteria are referred to as soil-to-groundwater maximum contaminant concentrations. Regulatory guidelines were used for comparative purposes to infer the potential risks and environmental impacts when necessary.

A brief explanation of the criteria and standards used for the comparison of site analytical results is presented below.

Federal Maximum Contaminant Levels - February 1996 and 1999 - Federal MCLs are enforceable standards for public water supplies promulgated under the Safe Drinking Water Act (SDWA) and are designed for the protection of human health. MCLs are based on laboratory or epidemiological studies and apply to drinking water supplies consumed by a minimum of 25 persons. They are designed for prevention of human health effects associated with lifetime exposure (70-year lifetime) of an average adult (70-kg) consuming 2 liters of water per day.

MCLs also consider the technical feasibility of removing the contaminant from the public water supply.

North Carolina Water Quality Standards (Groundwater) NCWQS, 1994 - NCWQS are the maximum allowable concentrations resulting from any discharge of contaminants to the land or waters of the state, which may be tolerated without creating a threat to human health or which otherwise render the groundwater unsuitable for its intended purpose.

North Carolina Soil-to-Groundwater Concentrations - 1996. Soil-to-Groundwater concentrations numbers are determined by North Carolina and based on the current Groundwater Protection Standard (2L) or Interim Maximum Allowable Concentration (IMAC). If there are no 2L or IMAC, the Soil-to-Groundwater number is based on the recommended 2L, or if not available, the Maximum Contaminant Level Goal (MCLG), which is based on a 10⁻⁶ carcinogenic risk.

6.3.4 Laboratory Analytical Results

This section discusses analytical results from the PA Sites field investigation activities that consisted of surface and subsurface soil, and groundwater samples.

Surface and subsurface soil analytical data was screened using the North Carolina soil-to-groundwater concentrations to assess which contaminants require further consideration. Inorganic compounds were further screened using base background data. Inorganic compound concentrations exceeding both North Carolina soil-to-groundwater concentrations and base background require further consideration. The results of the two comparison tests will also be assessed in evaluating which inorganics at the Air Station and Montford Point sites require further consideration.

Groundwater organic analytical data was screened using the NCWQS and USEPA MCLs for positive detections of VOCs in groundwater. Groundwater inorganic analytical data was screened using the NCWQS and base background groundwater data. Groundwater inorganic compound concentrations exceeding both NCWQS and base background require further consideration.

6.3.4.1 HPIA Building 1120

A total of three surface soil, three subsurface soil, and three groundwater samples (from temporary monitoring wells) were collected at Building 1120 and analyzed for VOCs, SVOCs, and TAL metals (Tables 6-1 and 6-3). Included on Tables 6-8 and 6-9 is a summary of analytical results for Building 1120, with comparison criteria for soil and groundwater, respectively. Figures 6-1, 6-2, 6-5 and 6-6 depict all positive detections at Building 1120 including comparison criteria for volatiles in soil, metals in soil, volatiles in groundwater, and metals in groundwater, respectively.

6.3.4.1.1 Soil

Volatile Organic Compounds

Six different VOCs were detected in the soil at Building 1120, as shown on Figure 6-1 and Table 6-9. However, only tetrachloroethene, detected at 54 J micrograms per kilogram (μ g/kg), exceeds the North Carolina soil-to-groundwater screening concentration of 20 μ g/kg.

No SVOCs were detected in any of the soil samples.

Metals

Eighteen metals were detected in the surface soil, and fourteen metals were detected in the subsurface soil at Building 1120, as shown on Figure 6-2 and Table 6-8. The only metals that exceed the North Carolina soil-to-groundwater concentrations are iron and mercury. No metals exceed the base background data for soils. Iron and mercury exceed the North Carolina soil-to-groundwater concentrations of 151.2 milligrams per kilogram (mg/kg) and 0.014 mg/kg, respectively. Iron results range from 270 mg/kg to 1,300 mg/kg, and mercury results are 0.018 mg/kg and 0.032 mg/kg.

6.3.4.1.2 Groundwater

Volatile Organic Compounds

Four different VOCs were detected in the groundwater at Building 1120, as shown on Figure 6-5 and Table 6-9. Three VOCs exceed the NCWQS. No VOCs exceeded the USEPA MCLs. The VOCs bromodichloromethane, chloroform, and dibromochloromethane exceed the NCWQS of 0.6 (interim) micrograms per liter (μ g/L), 0.19 μ g/L, and 0.41 (interim) μ g/L, respectively. Bromodichloromethane results range from 0.78 J μ g/L to 2.4 J μ g/L, chloroform results range from 3.4 J μ g/L to 8.7 μ g/L, and dibromochloromethane was detected at 0.84 J μ g/L.

No SVOCs were detected in any of the groundwater samples.

Metals

Sixteen different metals were detected in the groundwater at Building 1120, as shown on Figure 6-6 and Table 6-9. One metal exceeds the NCWQS. No metals exceed the base background data. One detection of iron at 2,100 μ g/L, exceeds the NCWQS of 300 μ g/L.

6.3.4.2 HPIA Building 1409

A total of three surface soil, three subsurface soil, and three groundwater samples (from temporary monitoring wells) were collected at Building 1409 and analyzed for VOCs, SVOCs, and TAL metals (Tables 6-1 and 6-3). Included on Tables 6-10 and 6-11 is a summary of analytical results for Building 1409, with comparison criteria for soil and groundwater, respectively. Figures 6-1, 6-3, 6-5 and 6-6 depict all positive detections at Building 1409 including comparison criteria for volatiles in soil, metals in soil, volatiles in groundwater, and metals in groundwater, respectively.

6.3.4.2.1 Soil

Volatile and Semi-Volatile Organic Compounds

One VOC (bis(2-ethylhexyl)phthalate 810 μ g/kg) and one SVOC (acetone 3.4 J μ g/kg) were detected in the soil at Building 1409, as shown on Figure 6-1 and Table 6-10. These detections do not exceed the North Carolina soil-to-groundwater screening concentrations of bis(2-ethylhexyl)phthalate 28,650 μ g/kg, and acetone 2,800 μ g/kg.

Metals

Eighteen metals were detected in the surface soil, and sixteen metals were detected in the subsurface soil at Building 1409, as shown on Figure 6-3 and Table 6-10. The only metals that exceed the North Carolina soil-to-groundwater concentrations are iron and mercury. No metals exceed the base background data for soils. Iron and mercury exceed the North Carolina soil-to-groundwater concentrations of 151.2 mg/kg and 0.014 mg/kg, respectively. Iron results range from 390 mg/kg to 2,600 mg/kg, and mercury results are 0.014 J mg/kg and 0.047 mg/kg.

6.3.4.2.2 Groundwater

Volatile Organic Compounds

Three different VOCs were detected in the groundwater at Building 1409, as shown on Figure 6-5 and Table 6-11. All three VOCs exceed the NCWQS. No VOCs exceeded the USEPA MCLs. The VOCs bromodichloromethane, chloroform, and dibromochloromethane exceed the NCWQS of 0.6 (interim) μ g/L, 0.19 μ g/L, and 0.41 (interim) μ g/L, respectively. Bromodichloromethane was detected at 5.6 J μ g/L, chloroform results are 1.5 J μ g/L and 31 μ g/L, and dibromochloromethane was detected at 1.3 J μ g/L.

No SVOCs were detected in any of the groundwater samples.

Metals

Fourteen different metals were detected in the groundwater at Building 1409, as shown on Figure 6-6 and Table 6-11. Two metals exceed the NCWQS. No metals exceed the base background

data. Two detections of iron, at 790 μ g/L and 9,700 μ g/L, exceed the NCWQS of 300 μ g/L. One detection of manganese, at 120 μ g/L, exceeds the NCWQS of 50 μ g/L.

6.3.4.3 HPIA Building 1512

A total of six subsurface soil and three groundwater samples (from temporary monitoring wells) were collected at Building 1512 and analyzed for VOCs, SVOCs, and TAL metals (Tables 6-1 and 6-3). Included on Tables 6-12 and 6-13 is a summary of analytical results for Building 1512, with comparison criteria for soil and groundwater, respectively. Figures 6-1, 6-4, 6-5 and 6-6 depict all positive detections at Building 1512 including comparison criteria for volatiles in soil, metals in soil, volatiles in groundwater, and metals in groundwater, respectively.

6.3.4.3.1 Soil

Volatile and Semi-Volatile Organic Compounds

One VOC and ten SVOCs were detected in the soil at Building 1512, as shown on Figure 6-1 and Table 6-12. No detections exceed the North Carolina soil-to-groundwater screening concentrations.

Metals

Nineteen metals were detected in the subsurface soil at Building 1512, as shown on Figure 6-4 and Table 6-12. Three metals exceed the base background soil data and two metals exceed the North Carolina soil-to-groundwater concentrations. Barium, calcium and lead exceed the base background soil data of 27.1 mg/kg, 4,950 mg/kg, and 12.2 J mg/kg, respectively. Barium was detected at 64 mg/kg, calcium at 17,000 mg/kg and lead at 29 mg/kg at one sample location (1512-IS01-05). Iron and mercury exceed the North Carolina soil-to-groundwater concentrations of 151.2 mg/kg and 0.014 mg/kg, respectively. Iron results range from 580 J mg/kg to 2,700 J mg/kg, and mercury results are 0.018 J mg/kg and 0.02 mg/kg.

6.3.4.3.2 Groundwater

Volatile Organic Compounds

Six different VOCs were detected in the groundwater at Building 1512, as shown on Figure 6-5 and Table 6-13. Four VOCs exceed the NCWQS. No VOCs exceeded the USEPA MCLs. The VOCs bromodichloromethane, chloroform, and dibromochloromethane exceed the NCWQS of 0.6 (interim) μ g/L, 0.19 μ g/L, and 0.41 (interim) μ g/L, respectively. Bromodichloromethane was detected at 0.61 J μ g/L and 3.3 J, chloroform results range from 1.2 J μ g/L to 15 μ g/L, and dibromochloromethane was detected at 0.83 J μ g/L.

No SVOCs were detected in any of the groundwater samples.

Metals

Eighteen different metals were detected in the groundwater at Building 1512, as shown on Figure 6-6 and Table 6-13. Two metals exceed the NCWQS, and only one metal exceeds the base background data. Arsenic and iron exceed the NCWQS of 5 μ g/L and 300 μ g/L, respectively. Arsenic was detected at 11 μ g/L, and iron results range from 400 μ g/L to 16,000 μ g/L. Selenium exceeds the base background data of 3.8 J μ g/L. Selenium was detected at 6.2 J μ g/L and 11 μ g/L.

6.3.4.4 Building SAS113

A total of four surface soil and four groundwater samples were collected at Building SAS113 and analyzed for TCL VOCs, SVOCs, pesticides/PCBs, and TAL metals (Tables 6-1 and 6-3). Included on Tables 6-14 and 6-15 is a summary of analytical results for Building SAS113, with comparison criteria for soil and groundwater, respectively. Figures 6-7, 6-8, 6-11 and 6-12 depict all positive detections at Building SAS113 including comparison criteria for soil and in groundwater.

6.3.4.4.1 Soil

Volatile and Semi-Volatile Organic Compounds

Two VOCs and one SVOC were detected in the soil at Building SAS113, as shown on Figure 6-7 and Table 6-14. No detections exceed the North Carolina soil-to-groundwater screening concentrations.

Pesticides/PCBs

Four pesticides were detected in the surface soil at Building SAS113, as shown on Figure 6-7 and Table 6-14. No detections exceed the North Carolina soil-to-groundwater screening concentrations.

Metals

Fourteen metals were detected in the surface soil at Building SAS113, as shown on Figure 6-8 and Table 6-14. The only metal that exceeds the North Carolina soil-to-groundwater concentration is iron. No metals exceed the base background data for soils. Iron exceeds the North Carolina soil-to-groundwater concentration of 151.2 mg/kg; iron results range from 981 mg/kg to 2,360 mg/kg.

6.3.4.4.2 Groundwater

Volatile and Semi-Volatile Organic Compounds

One VOC and one SVOC were detected in the groundwater at Building SAS113, as shown on Figure 6-11 and Table 6-15. The VOC, carbon disulfide, and the SVOC, caprolactam, did not exceed the NCWQS of 700 μ g/L and 3500 μ g/L, respectively.

Pesticides/PCBs

One pesticide, beta-BHC, was detected in the groundwater at one location at Building SAS113. Beta-BHC was detected at 0.028 μ g/L which exceeds the NCWQS of 0.019 μ g/L for total BHC. A MCL has not been established for the pesticide.

Metals

Seventeen different metals were detected in the groundwater at Building SAS113, as shown on Figure 6-12 and Table 6-15. Four metals exceed the NCWQS: arsenic, chromium, iron, and manganese exceed the NCWQS of 5 μ g/L, 50 μ g/L, 300 μ g/L, and 50 μ g/L, respectively. Eleven metals exceeded the base background data.

6.3.4.5 Building AS116

A total of four surface soil and four groundwater samples were collected at Building AS116 and analyzed for TCL VOCs, SVOCs, pesticides/PCBs, and TAL metals (Tables 6-1 and 6-3). Included on Tables 6-16 and 6-17 is a summary of analytical results for Building AS116, with comparison criteria for soil and groundwater, respectively. Figures 6-7, 6-9, 6-11 and 6-12 depict all positive detections at Building AS116 including comparison criteria for soil and groundwater.

6.3.4.5.1 Soil

Volatile and Semi-Volatile Organic Compounds

Two VOCs and two SVOCs were detected in the soil at Building AS116, as shown on Figure 6-7 and Table 6-16. No detections exceed the North Carolina soil-to-groundwater screening concentrations.

Pesticides/PCBs

Eight pesticides were detected in the soil at Building AS116. No detections exceed the North Carolina soil-to-groundwater screening concentrations.

Metals

Thirteen metals were detected in the surface soil at Building AS 116, as shown on Figure 6-9 and Table 6-16. The only metal that exceeds the North Carolina soil-to-groundwater concentration is iron. No metals exceed the base background data for soils. Iron exceeds the North Carolina soil-to-groundwater concentration of 151.2 mg/kg; iron results range from 834 mg/kg to 1,310 mg/kg.

6.3.4.5.2 Groundwater

Volatile and Semi-Volatile Organic Compounds

Four VOCs and three SVOCs were detected in the groundwater at Building AS116, as shown on Figure 6-11 and Table 6-17. No VOCs exceeded the NCWQS or MCLs. Two SVOCs, bis(2-ethylhexyl)phthalate (BEHP) and pentachlorophenol exceeded the NCWQS of 2.5 μ g/L and 0.29 μ g/L, respectively. BEHP and pentachlorophenol were detected at 11 μ g/L and 7 J μ g/L, respectively. No VOCs or SVOCs exceeded MCLs.

Pesticides/PCBs

One pesticide, alpha-chlordane, was detected in the groundwater at one location at Building AS116. The compound was detected at 0.01 J μ g/L, which does not exceed the NCWQS for total chlordane (0.1 μ g/L). This detection also does not exceed the MCL of 2 μ g/L for chlordane.

Metals

Nineteen different metals were detected in the groundwater at Building AS116, as shown on Figure 6-12 and Table 6-17. Six metals exceed the NCWQS: arsenic, cadmium, chromium, iron, lead, and manganese exceed the NCWQS of 5 μ g/L, 1.75 μ g/L, 50 μ g/L, 300 μ g/L, 15 μ g/L, and 50 μ g/L, respectively. Five of the metals were detected at concentrations that exceed the Base background data.

6.3.4.6 Building AS119

A total of four surface soil and four groundwater samples were collected at Building AS119 and analyzed for TCL VOCs, SVOCs, pesticides/PCBs, and TAL metals (Tables 6-1 and 6-3). Included on Tables 6-18 and 6-19 is a summary of analytical results for Building AS119, with comparison criteria for soil and groundwater, respectively. Figures 6-7, 6-10, 6-11 and 6-12 depict all positive detections at Building AS119 including comparison criteria for soil and in groundwater.

6.3.4.6.1 Soil

Volatile and Semi-Volatile Organic Compounds

Three VOCs and fourteen SVOCs were detected in the soil at Building AS119, as shown on Figure 6-7 and Table 6-18. Benzo(a)pyrene and dibenz(a,h)anthracene were detected at 780 μ g/kg and 220J μ g/kg, which exceeds the North Carolina soil-to-groundwater screening concentrations of 92.8 μ g/kg and 172 μ g/kg, respectively.

Pesticides/PCBs

Nine pesticides were detected in the soil at Building AS119. One detection of 4,4'-DDD (140 $\mu g/kg$) exceeded the North Carolina soil-to-groundwater screening concentration of 129 $\mu g/kg$.

Metals

Sixteen metals were detected in the surface soil at Building AS119, as shown on Figure 6-10 and Table 6-18. The only metal that exceeds the North Carolina soil-to-groundwater concentration is

iron. No metals exceed the base background data for soils. Iron exceeds the North Carolina soil-to-groundwater concentration of 151.2 mg/kg; iron results range from 992 mg/kg to 3,260 mg/kg.

6.3.4.6.2 Groundwater

Volatile and Semi-Volatile Organic Compounds

Three VOCs and two SVOCs were detected in the groundwater at Building AS119, as shown on Figure 6-11 and Table 6-19. One SVOC, BEHP, exceeded the NCWQS of 2.5 μ g/L and MCL of 6 μ g/L. BEHP was detected at 11 μ g/L.

Pesticides/PCBs

Two pesticides were detected in the groundwater at Building AS119. Beta-BHC and delta-BHC were detected at $0.019 \text{ J} \mu\text{g/L}$ and $0.014 \text{ J} \mu\text{g/L}$, respectively, which exceeds the NCWQS for total BHC ($0.019 \mu\text{g/L}$). An MCL has not been established for the pesticide.

Metals

Nineteen different metals were detected in the groundwater at Building AS119, as shown on Figure 6-12 and Table 6-19. Five metals exceed the NCWQS: arsenic, chromium, iron, lead, and manganese exceed the NCWQS of 5 μ g/L, 50 μ g/L, 300 μ g/L, 15 μ g/L, and 50 μ g/L, respectively. Fourteen metals exceed the base background.

6.3.4.7 Building M119

A total of four surface soil and four groundwater samples were collected at Building M119 and analyzed for TCL VOCs, SVOCs, pesticides/PCBs, and TAL metals (Tables 6-1 and 6-3). Included on Tables 6-20 and 6-21 is a summary of analytical results for Building M119, with comparison criteria for soil and groundwater, respectively. Figures 6-13, 6-14, 6-16 and 6-17 depict all positive detections at Building M119 including comparison criteria for soil and groundwater.

6.3.4.7.1 Soil

Volatile and Semi-Volatile Organic Compounds

One VOC and two SVOCs were detected in the soil at Building M119, as shown on Figure 6-13 and Table 6-20. No detections exceed the North Carolina soil-to-groundwater screening concentrations.

Pesticides/PCBs

Seven pesticides were detected in the surface soil at Building M119. No detections exceed the North Carolina soil-to-groundwater screening concentrations.

Metals

Fifteen metals were detected in the surface soil at Building M119, as shown on Figure 6-14 and Table 6-20. The only metal that exceeds the North Carolina soil-to-groundwater concentration is iron. No metals exceed the base background data for soils. Iron exceeds the North Carolina soil-to-groundwater concentration of 151.2 mg/kg; iron results range from 977 mg/kg to 2,260 mg/kg.

6.3.4.7.2 Groundwater

Volatile and Semi-Volatile Organic Compounds

Three VOCs were detected in the groundwater at Building M119, as shown on Figure 6-16 and Table 6-21. No VOCs exceeded the NCWQS or MCLs.

No SVOCs were detected in the groundwater samples.

Pesticides/PCBs

Two pesticides were detected in the groundwater at Building M119. Beta-BHC and delta-BHC were detected at $0.013 \text{ J} \mu\text{g/L}$ and $0.01 \text{ J} \mu\text{g/L}$, respectively, which exceeds the NCWQS for total BHC ($0.019 \mu\text{g/L}$). An MCL has not been established for the pesticide.

Metals

Sixteen different metals were detected in the groundwater at Building M119, as shown on Figure 6-17 and Table 6-21. Two metals, iron and manganese, exceed the NCWQS of 300 μ g/L and 50 μ g/L, respectively. Iron detections range from 1,610 μ g/L to 8,720 μ g/L. Manganese was detected at 74.8 μ g/L. Neither of these two metals were among the nine metals that exceeded the base background data.

6.3.4.8 Building M315

A total of four surface soil and four groundwater samples were collected at Building M315 and analyzed for TCL VOCs, SVOCs, pesticides/PCBs, and TAL metals (Tables 6-1 and 6-3). Included on Tables 6-22 and 6-23 is a summary of analytical results for Building M315, with comparison criteria for soil and groundwater, respectively. Figures 6-13, 6-15, 6-16 and 6-17

depict all positive detections at Building M315 including comparison criteria for soil and groundwater.

6.3.4.8.1 Soil

Volatile and Semi-Volatile Organic Compounds

One VOC and one SVOC were detected in the soil at Building M315, as shown on Figure 6-13 and Table 6-22. No detections exceed the North Carolina soil-to-groundwater screening concentrations.

Pesticides/PCBs

Seven pesticides were detected in the surface soil at Building M315. No detections exceed the North Carolina soil-to-groundwater screening concentrations.

Metals

Fourteen metals were detected in the surface soil at Building M315, as shown on Figure 6-15 and Table 6-22. The only metal that exceeds the North Carolina soil-to-groundwater concentration is iron. No metals exceed the base background data for soils. Iron exceeds the North Carolina soil-to-groundwater concentration of 151.2 mg/kg; iron results range from 667 mg/kg to 1,830 mg/kg.

6.3.4.8.2 Groundwater

Volatile and Semi-Volatile Organic Compounds

No VOCs were detected in the groundwater samples.

One SVOC, BEHP, exceeded the NCWQS of 2.5 μ g/L. BEHP was detected at 4 J μ g/L, below the MCL of 6 μ g/L.

Pesticides/PCBs

One pesticide was detected in the groundwater at Building M315. Beta-BHC was detected at 0.014 J μ g/L, which does not exceed the NCWQS for total BHC (0.019 μ g/L). An MCL has not been established for the pesticide.

Metals

Eighteen different metals were detected in the groundwater at Building M315, as shown on Figure 6-17 and Table 6-23. Three metals, arsenic, iron and lead, exceed the NCWQS of 5 μ g/L, 300 μ g/L and 15 μ g/L, respectively. Nine metals exceed the base background data.

6.4 Summary of Findings of the PA Sites Field Investigation

6.4.1 **HPIA Building 1120**

As shown on Figure 6-1 there is one VOC (tetrachloroethene 54 J $\mu g/kg$) in surface soil that exceeds the North Carolina soil-to-groundwater concentration (20 $\mu g/kg$) at sample location 78-IS02-1120-01. This sample was collected at a depth of 1 to 2 ft bgs. There were no detections in the subsurface soil sample (78-IS02-1120-05) collected at a depth of 10 ft bgs. There were also no detections of tetrachloroethene from the groundwater sample collected at this location. Since there were no detections of this compound below the surface soil, it is suspected that a localized spill may account for the detection in surface soil. Therefore, it is recommended that Building 1120 require no further investigation for VOCs or SVOCs in the soil.

As shown on Figure 6-2 there are two metals (iron and mercury) in surface and subsurface soil that exceed the North Carolina soil-to-groundwater concentrations. There are no detections that exceed the base background soil data. Since these detections do not exceed the base background soil data, it is recommended that metals in soils require no further investigation.

As shown on Figure 6-5 there are three VOCs (bromodichloromethane, chloroform, and dibromochloromethane) that exceed the NCWQS in groundwater. There are no detections that exceed the MCLs. It is recommended that the groundwater require no further investigation for VOCs or SVOCs since the detections of these VOCs may be attributed to sample contamination from equipment due to the low concentrations of these VOCs detected throughout the analytical results from all groundwater samples collected at the PA Sites, as illustrated on Figure 6-5.

As shown on Figure 6-6 there is one metal (iron) that exceeds the NCWQS. No metals exceed the base background data for groundwater. Since no metals exceed the base background data, it is recommended that the groundwater at Building 1120 require no further investigation.

In summary, the analytical data shows that Building 1120 requires no further investigation, and there is no evidence from this data to suggests that this area has been impacted from past site operations.

6.4.2 <u>HPIA Building 1409</u>

As shown on Figure 6-1 there are no VOCs or SVOCs at Building 1409 that exceed the North Carolina soil-to-groundwater concentrations. Based on this data, it is recommended that the soils at Building 1409 require no additional investigation for VOCs or SVOCs.

As shown on Figure 6-3 there are two metals (iron and mercury) in surface and/or subsurface soil that exceed the North Carolina soil-to-groundwater concentrations. There are no detections that exceed the base background soil data. Since these detections do not exceed the base background soil data, it is recommended that metals in soils require no further investigation.

As shown on Figure 6-5 there are three VOCs (bromodichloromethane, chloroform, and dibromochloromethane) that exceed the NCWQS in groundwater. There are no detections that exceed the MCLs. It is recommended that the groundwater require no further investigation for VOCs or SVOCs since the detections of these VOCs may be attributed to sample contamination from equipment due to the low concentrations of these VOCs detected throughout the analytical results from all groundwater samples collected at the PA Sites, as illustrated on Figure 6-5.

As shown on Figure 6-6 there are two metals (iron and manganese) that exceed the NCWQS in groundwater. There are no detections that exceed the base background concentrations. Since no metals exceed the base background concentrations, it is recommended that the metals in groundwater require no further investigation at Building 1409.

In summary, the analytical data shows that Building 1409 requires no further investigation, and there is no evidence from this data to suggests that this area has been impacted from past site operations.

6.4.3 HPIA Building 1512

As shown on Figure 6-1 there are no VOCs or SVOCs that exceed the North Carolina soil-to-groundwater concentrations. Based on this data, it is recommended that the soils at Building 1512 require no additional investigation for VOCs or SVOCs.

As shown on Figure 6-4 there are three metals (barium, calcium and lead) in subsurface soil that exceed the base background concentrations and two metals (iron and mercury) in surface and/or

subsurface soil that exceed the North Carolina soil-to-groundwater concentrations. Since the above inorganics did not exceed both the background and soil-to-groundwater concentrations, and calcium is an essential nutrient, it is recommended that metals in soils require no further investigation.

As shown on Figure 6-5 there are three VOCs (bromodichloromethane, chloroform, and dibromochloromethane) that exceed the NCWQS in groundwater. There are no detections that exceed the MCLs. It is recommended that the groundwater require no further investigation for VOCs or SVOCs since the detections of these VOCs may be attributed to sample contamination from equipment due to the low concentrations of these VOCs detected throughout the analytical results from all groundwater samples collected at the PA Sites, as illustrated on Figure 6-5.

As shown on Figure 6-6 there are four metals (arsenic, chromium, iron, and lead) that exceed the NCWQS, and one metal (selenium) that exceeds the base background data for groundwater. Since no metals exceed both criteria, it is recommended that the metals in groundwater require no further investigation at Building 1512.

In summary, the analytical data shows that Building 1512 requires no further investigation, and there is no evidence from this data to suggests that this area has been impacted from past site operations.

6.4.4 Building SAS113

As shown on Figure 6-7 there are no VOCs, SVOCs, pesticides, or PCBs that exceed the North Carolina soil-to-groundwater concentrations. Based on this data, it is recommended that the soils at Building SAS113 require no additional investigation for VOCs, SVOCs, pesticides, or PCBs.

As shown on Figure 6-8, there is one metal (iron) in surface soil that exceeds the North Carolina soil-to-groundwater concentrations; however, the detections of the inorganic do not exceed the base background data. A different metal, calcium, was identified as an exceedance in the two background comparison tests; however, calcium is considered an essential nutrient. It is recommended that metals in soils require no further investigation.

As shown on Figure 6-11 there are no VOCs, SVOCs, or PCBs that exceed the NCWQS in groundwater. One pesticide, beta-BHC, exceeds the NCWQS for BHC. There are no detections

that exceed the MCLs. It is recommended that the groundwater require no further investigation for VOCs, SVOCs, pesticides, or PCBs.

As shown on Figure 6-12 there are five metals (arsenic, chromium, iron, lead, and manganese) that exceed the NCWQS. Chromium, iron, and lead are also among the 11 metals that exceed the base background data for groundwater. It is recommended that additional groundwater investigation be conducted at Building SAS113 by installing one monitoring well in the location with the hottest screening results and sampled using low-flow methods.

In summary, the analytical data shows that Building SAS113 requires additional investigation of metals in groundwater.

6.4.5 Building AS116

As shown on Figure 6-7 there are no VOCs, SVOCs, pesticides, or PCBs that exceed the North Carolina soil-to-groundwater concentrations. Based on this data, it is recommended that the soils at Building AS116 require no additional investigation for VOCs, SVOCs, pesticides, or PCBs.

As shown on Figure 6-9 there is one metal (iron) in surface soil that exceeds the North Carolina soil-to-groundwater concentrations. Since the detections of the inorganic do not exceed the base background data, it is recommended that metals in soils require no further investigation.

As shown on Figure 6-11, BEHP and pentachlorophenol exceed both the NCWQS and the MCLs. It is recommended that the groundwater require no further investigation for VOCs, SVOCs, pesticides, or PCBs since BEHP and pentachlorophenol were detected in one sample, indicating that it is not widespread. Also, BEHP is a common laboratory contaminant.

As shown on Figure 6-12 there are four metals (arsenic, chromium, iron, and lead) that exceed the NCWQS. Arsenic, chromium, iron, and lead are also among the 15 inorganics that exceed the base background data for groundwater. It is recommended that metals in groundwater be further investigated by installing one monitoring well in the location with the hottest screening results and sampled using low-flow methods.

In summary, the analytical data shows that Building AS116 requires further investigation of groundwater.

6.4.6 Building AS119

As shown on Figure 6-7 there are two SVOCs (benzo(a)anthracene and dibenz(a,h)anthracene) and one pesticide (4,4'-DDD) that exceed the North Carolina soil-to-groundwater concentrations. Based on this data, it is recommended that the soils at Building AS119 require further investigation for SVOCs and pesticides.

As shown on Figure 6-10 there is one metal (iron) in surface soil that exceeds the North Carolina soil-to-groundwater concentrations; however, the detections of the inorganic do not exceed the base background data. A different metal, cadmium, was identified as an exceedance in the two background comparison tests. It is recommended that metals in soils require further investigation.

As shown on Figure 6-11, chloroform and BEHP exceed the NCWQS. BEHP also exceeds the MCLs. Beta-BHC and delta-BHC together exceed the NCWQS for BHC. There are no detections that exceed the MCLs. It is recommended that the groundwater require no further investigation for VOCs, SVOCs, pesticides, or PCBs since there was only one detection of BEHP and the detection was at low levels, possibly due to laboratory contamination.

As shown on Figure 6-12 there are five metals (arsenic, chromium, iron, lead, and manganese) that exceed the NCWQS. Chromium, iron, and lead are also among the 14 inorganics that exceed the base background data for groundwater. It is recommended that metals in groundwater be further investigated by installing one monitoring well in the location with the hottest screening results and sampled using low-flow methods.

In summary, the analytical data shows that Building AS119 requires further investigation of soil and groundwater.

6.4.7 Building M119

As shown on Figure 6-13, there are no VOCs, SVOCs, pesticides, or PCBs that exceed the North Carolina soil-to-groundwater concentrations. Based on this data, it is recommended that the soils at Building M119 require no additional investigation for VOCs, SVOCs, pesticides, or PCBs.

As shown on Figure 6-14 there is one metal (iron) in surface soil that exceeds the North Carolina soil-to-groundwater concentrations. Since the detections of the inorganic do not exceed the base background data, it is recommended that metals in soils require no further investigation.

As shown on Figure 6-16, there are no VOCs, SVOCs, or PCBs that exceed the NCWQS in groundwater. Beta-BHC and delta-BHC together exceed the NCWQS for BHC. There are no detections that exceed the MCLs. It is recommended that the groundwater require no further investigation for VOCs, SVOCs, pesticides, or PCBs.

As shown on Figure 6-17 there are two metals (iron and manganese) that exceed the NCWQS; however, these two inorganics do not exceed the base background data for groundwater. High metal concentrations could be due to the collection of samples using DPT and not filtering. It is recommended that metals in groundwater be further investigated by installing one monitoring well in the location with the hottest screening results and sampled using low-flow methods.

In summary, the analytical data shows that Building M119 requires further investigation of metals in groundwater.

6.4.8 Building M315

As shown on Figure 6-13, there are no VOCs, SVOCs, pesticides, or PCBs that exceed the North Carolina soil-to-groundwater concentrations. Based on this data, it is recommended that the soils at Building M119 require no additional investigation for VOCs, SVOCs, pesticides, or PCBs.

As shown on Figure 6-15 there is one metal (iron) in surface soil that exceeds the North Carolina soil-to-groundwater concentrations; however, the detections of the inorganic do not exceed the base background data. Additionally, lead was identified as an exceedance in the two comparison tests performed; therefore, it is recommended that metals in soils be further investigated.

As shown on Figure 6-16, BEHP exceeds the NCWQS. There are no detections that exceed the MCLs. It is recommended that the groundwater require no further investigation for VOCs, SVOCs, pesticides, or PCBs.

As shown on Figure 6-17 there are three metals (arsenic, iron, and lead) that exceed the NCWQS. Lead is also among the nine inorganics that exceed the base background data for groundwater. It is recommended that metals in groundwater be further investigated by installing one monitoring well in the location with the hottest screening results and sampled using low-flow methods.

In summary, the analytical data shows that Building M315 requires further investigation of inorganics in soil and groundwater.

6.5 Conclusions and Recommendations

Based on the data collected and evaluated for the eight sites recommended for field investigation activities, additional field investigation activities should be completed at the following five sites:

Air Station

- Building SAS113 (groundwater)
- Building AS116 (groundwater)
- Building AS119 (soil and groundwater)

Montford Point

- Building M119 (groundwater)
- Building M315 (soil and groundwater)

Field investigation activities might include as appropriate:

- Collection and analysis of additional surface and subsurface soil samples to assess
 whether soils contain contamination.
- Collection and analysis of groundwater samples to determine if inorganic concentrations exceed background concentrations, thereby indicating whether local groundwater quality has been affected by past site operations. It is recommended to install one monitoring well in the location of the highest screening results and to sample using low-flow methods at each of the five sites identified above.

The field investigation activities would be limited to the identified areas of concern. The information obtained during a field investigation would aid in confirming the presence or absence of contamination and to confirm the identified migration and exposure pathways.

Investigations into these sites should also direct any non-CERCLA issues to the appropriate RCRA regulatory programs as identified in Appendix C.

The HPIA PA sites (Buildings 1120, 1409, and 1512) will not require further action as determined during the October 2002 Partnering Meeting.

TABLE 6-1
SOIL SAMPLE SUMMARY
PA SITES FIELD INVESTIGATION
PRELIMINARY ASSESSMENT SITES, CTO - 0190
MCB CAMP LEJEUNE, NORTH CAROLINA

	Date	Time	Depth	TCL	TCL	TAL	Pesticides/
Sample ID	Sampled		Interval (ft)	VOA	SVOC	Metals	PCBs
IR78-1120-IS01-01	6/28/2002	1210	1-2	Yes	Yes	Yes	No
IR78-1120-IS01-01D	6/28/2002	1210	1-2	Yes	Yes	Yes	No
IR78-1120-IS01-05	6/28/2002	1220	10.5	Yes	Yes	Yes	No
IR78-1120-IS02-01	6/28/2002	1355	1-3	Yes	Yes	Yes	No
IR78-1120-IS02-01D	6/28/2002	1355	1-3	Yes	Yes	Yes	No
IR78-1120-IS02-04	6/28/2002	1400	7.5	Yes	Yes	Yes	No
IR78-1120-IS03-01	6/28/2002	1410	1-2	Yes	Yes	Yes	No
IR78-1120-IS03-01D	6/28/2002	1410	1-2	Yes	Yes	Yes	No
IR78-1120-IS03-05	6/28/2002	1420	10	Yes	Yes	Yes	No
IR78-1409-IS01-01	6/28/2002	0725	1.5	Yes	Yes	Yes	No
IR78-1409-IS01-05	6/28/2002	0740	10	Yes	Yes	Yes	No
IR78-1409-IS02-01	6/28/2002	0805	2	Yes	Yes	Yes	No
IR78-1409-IS02-04	6/28/2002	0810	8.5	Yes	Yes	Yes	No
IR78-1409-IS03-01	6/28/2002	0840	1-3	Yes	Yes	Yes	No
IR78-1409-IS03-01MS/MSD	6/28/2002	0840	1-3	Yes	Yes	Yes	No
IR78-1409-IS03-04	6/28/2002	0850	8.5	Yes	Yes	Yes	No
IR78-1512-IS01-03	6/27/2002	1440	7	Yes	Yes	Yes	No
IR78-1512-IS01-05	6/27/2002	1445	10	Yes	Yes	Yes	No
IR78-1512-IS02-04	6/27/2002	1500	8	Yes	Yes	Yes	No
IR78-1512-IS02-05	6/27/2002	1504	9.5	Yes	Yes	Yes	No
IR78-1512-IS03-02	6/27/2002	1520	4	Yes	Yes	Yes	No
IR78-1512-IS03-05	6/27/2002	1525	10	Yes	Yes	Yes	No
IRP1-SS-IS01-1-2	6/7/2004	1350	1-2	Yes	Yes	Yes	Yes
IRP1-SS-IS02-1-2	6/7/2004	1500	1-2	Yes	Yes	Yes	Yes
IRP1-SS-IS03-1-3	6/11/2004	1210	1-3	Yes	Yes	Yes	Yes
IRP1-SS-IS04-1-3	6/11/2004	1330	1-3	Yes	Yes	Yes	Yes
IRP2-SS-IS01-2-3	6/7/2004	1240	2-3	Yes	Yes	Yes	Yes
IRP2-SS-IS02-1-2	6/7/2004	1100	1-2	Yes	Yes	Yes	Yes
IRP2-SS-IS03-1-3	6/11/2004	1005	1-3	Yes	Yes	Yes	Yes
IRP2-SS-IS04-1-3	6/11/2004	1100	1-3	Yes	Yes	Yes	Yes
IRP3-SS-IS01-1-2	6/9/2004	0730	1-2	Yes	Yes	Yes	Yes
IRP3-SS-IS02-2-3	6/9/2004	0845	2-3	Yes	Yes	Yes	Yes
IRP3-SS-IS03-0-3	6/10/2004	1630	0-3	Yes	Yes	Yes	Yes
IRP3-SS-IS04-1-3	6/11/2004	0750	1-3	Yes	Yes	Yes	Yes
IRP4-SS-IS01-0-3	6/9/2004	1230	0-3	Yes	Yes	Yes	Yes
IRP4-SS-IS02-0-3	6/9/2004	1410	0-3	Yes	Yes	Yes	Yes
IRP4-SS-IS03-1-3	6/10/2004	1245	1-3	Yes	Yes	Yes	Yes
IRP4-SS-IS04-0-3	6/10/2004	1430	0-3	Yes	Yes	Yes	Yes
IRP5-SS-IS01-0-3	6/9/2004	1550	0-3	Yes	Yes	Yes	Yes
IRP5-SS-IS02-0-4	6/9/2004	1800	0-4	Yes	Yes	Yes	Yes
IRP5-SS-IS03-0-3	6/10/2004	0810	0-3	Yes	Yes	Yes	Yes
IRP5-SS-IS03-DUP-0-3	6/10/2004	0810	0-4	Yes	Yes	Yes	Yes
IRP5-SS-IS04-0-3	6/10/2004	1000	0-3	Yes	Yes	Yes	Yes

TABLE 6-2

TEMPORARY MONITORING WELL GROUNDWATER FIELD PARAMETERS HPIA PA SITES FIELD INVESTIGATION PRELIMINARY ASSESSMENT SITES, CTO - 0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

			Field Parameters						
Well Number	Measuring	Well	Temperature	•	Specific Conductance	-			
Sample Date	Time	Volumes	(°C)	(S.U.)	(µmhos/cm)	(N.T.U.)			
78-1120-TW01	1333	1.0	24.7	4.52	404	160			
7/01/02	1346	3.0	25.7	4.62	391	20			
	1356	4.5	25.1	4.07	371	291			
	1412	6.0	24.4	4.08	359	>1,000			
	1419	7.0	24.1	4.01	344	33			
78-1120-TW02	1353	2.0	24.6	4.49	154	1000			
7/01/02	1400	3.0	24.6	4.38	151	273			
	1415	5.0	25.2	4.40	148	89			
	1425	6.0	24.3	4.39	142	38			
	1432	7.0	24.4	4.40	136	23			
78-1120-TW03	1520	1.0	23.1	4.58	140	>1,000			
7/01/02	1525	2.0	22.2	3.88	134	792			
	1533	3.0	22.1	3.81	133	447			
	1540	4.0	22.0	3.85	134	50			
	1547	5.0	21.9	3.74	134	48			
	1554	6.0	21.7	3.81	136	112			
78-1409-TW01	1753	1.0	24.5	5.69	165	>1,000			
07/01/02	1800	2.0	24.1	5.78	158	99			
	1810	3.0	24.0	5.50	150	32			
	1815	4.0	24.0	5.17	143	20			
	1824	5.0	23.8	5.24	147	6			
78-1409-TW02	1755	1.0	24.0	5.15	477	>1,000			
7/01/02	1706	3.0	23.8	5.21	367	825			
	1716	4.0	23.7	5.02	311	342			
	1824	6.0	23.6	5.06	289	237			
	1844	8.0	24.0	5.26	276	79			
	1853	9.0	23.8	5.10	267	58			
	1900	10.0	23.4	5.09	262	34			
78-1409-TW03	1655	1.0	26.4	5.05	398	353			
7/01/02	1703	2.0	25.1	5.17	390	152			
	1709	3.0	25.2	5.24	356	278			
	1715	4.0	25.3	5.32	342	20			

TABLE 6-2

TEMPORARY MONITORING WELL GROUNDWATER FIELD PARAMETERS HPIA PA SITES FIELD INVESTIGATION PRELIMINARY ASSESSMENT SITES, CTO - 0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

			Field Parameters						
Well Number Sample Date	Measuring Time	Well Volumes	Temperature (°C)	рН (S.U.)	Specific Conductance (µmhos/cm)	Turbidity (N.T.U.)			
78-1512-TW01	0840	1.0	21.4	5.50	8	>1,000			
07/01/02	0850	2.0	21.6	5.75	82	500			
	0901	3.0	21.5	5.80	82	800			
	0913	4.0	21.7	5.74	84	750			
	0922	5.0	22.1	5.52	83	550			
	0933	6.0	21.9	5.34	81	400			
	0944	7.0	21.8	4.66	80	270			
	0955	8.0	21.8	4.58	79	180			
	1008	9.0	21.7	4.60	79	120			
	1023	10.0	21.9	4.59	79	100			
78-1512-TW02	0820	2.0	21.9	5.15	348	230			
07/01/02	0830	3.0	21.6	5.79	277	100			
	0844	4.0	21.2	5.31	245	50			
	0858	5.5	21.4	5.57	234	36			
	0905	6.5	21.3	5.62	222	27			
78-1512-TW03	1110	1.0	25.0	4.62	123	>1,000			
07/01/02	1117	2.0	23.5	4.45	116	>1,000			
	1125	3.0	23.6	4.58	113	>1,000			
	1134	4.0	23.9	4.61	111	>1,000			
	1143	5.0	23.4	4.43	110	>1,000			
	1152	6.0	23.5	4.60	109	>1,000			
	1159	7.0	23.4	4.39	108	>1,000			
	1206	8.0	23.2	4.51	109	>1,000			
	1211	9.0	23.4	4.43	108	>1,000			

Notes:

°C = Degrees Centigrade S.U. = Standard Units

 $\begin{array}{ccc} & & - \text{ sundard Units} \\ \mu \text{mhos/cm} & = \text{micro ohms per centimeter} \\ mg/L & = \text{milligrams per liter} \end{array}$

mv = millivolts

N.T.U. = Nephlometric Turbidity Units

NA = Not Applicable

TABLE 6-3 GROUNDWATER SAMPLE SUMMARY PA SITES FIELD INVESTIGATION PRELIMINARY ASSESSMENT SITES, CTO - 0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

Location	Date Sampled	TCL VOCs	TCL SVOCs	TAL Metals	TCL Pesticides/ PCBs
78-1120-TW01	7/1/2002	X	X	X	NA
78-1120-TW02	7/1/2002	X	X	X	NA
78-1120-TW03	7/1/2002	X	X	X	NA
78-1409-TW01	7/1/2002	X	X	X	NA
78-1409-TW02	7/1/2002	X	X	X	NA
78-1409-TW03	7/1/2002	X	X	X	NA
78-1512-TW01	7/1/2002	X	X	X	NA
78-1512-TW02	7/1/2002	X	X	X	NA
78-1512-TW03	7/1/2002	X	X	X	NA
IRP1-GW-IS01-6-10	6/7/2004	X	X	X	X
IRP1-GW-IS02-6-10	6/7/2004	X	X	X	X
IRP1-GW-IS03-6-10	6/11/2004	X	X	X	X
IRP1-GW-IS04-6-10	6/11/2004	X	X	X	X
IRP2-GW-IS01-7-11	6/7/2004	X	X	X	X
IRP2-GW-IS02-6-10	6/7/2004	X	X	X	X
IRP2-GW-IS03-6-10	6/11/2004	X	X	X	X
IRP2-GW-IS04-6-10	6/11/2004	X	X	X	X
IRP3-GW-IS01-6-10	6/9/2004	X	X	X	X
IRP3-GW-IS02-6-10	6/9/2004	X	X	X	X
IRP3-GW-IS03-6-10	6/10/2004	X	X	X	X
IRP3-GW-IS04-6-10	6/11/2004	X	X	X	X
IRP4-GW-IS01-12-16	6/9/2004	X	X	X	X
IRP4-GW-IS02-12-16	6/9/2004	X	X	X	X
IRP4-GW-IS03-12-16	6/10/2004	X	X	X	X
IRP4-GW-IS04-14-18	6/10/2004	X	X	X	X
IRP5-GW-IS01-16-20	6/9/2004	X	X	X	X
IRP5-GW-IS02-16-20	6/9/2004	X	X	X	X
IRP5-GW-IS03-16-20	6/10/2004	X	X	X	X
IRP5-GW-IS03-DUP-16-20	6/10/2004	X	X	X	X
IRP5-GW-IS04-15-19	6/10/2004	X	X	X	X

Notes:

TCL = Target Compound List VOC = Volatile Organic Compounds

TAL = Target Analyte List
NA = Not Analyzed
X = Requested Analysis

TABLE 6-4
STATISTICS SUMMARY FOR INORGANICS IN SURFACE SOILS
BASE BACKGROUND STUDY
MCB, CAMP LEJEUNE, NORTH CAROLINA

	Distribution	Frequency of Detection	Range	Arithmetic Mean Half Non-Detects	Arithmetic Mean + 2 Standard Deviations	Log Arithmetic Mean Half Non-Detects	Log Arithmetic Mean + 2 Standard Deviations
METALS (mg/kg)							
Aluminum	Neither	50/50	29.4 - 17600J	2,744	8,965	1,188	34,892
Antimony	Neither	19/50	ND - 0.9J	0.223	0.564	0.179	0.644
Arsenic	Neither	18/50	ND - 1.3J	0.313	0.879	0.232	1.00
Barium	Neither	46/50	ND - 24	7.23	19.4	4.35	51.9
Beryllium	Lognormal	31/50	ND - 0.53J	0.0517	0.205	0.0302	0.252
Cadmium	Neither	5/50	ND - 0.11J	0.0163	0.053	0.0129	0.038
Calcium	Neither	42/50	ND - 105000	3,180	33,240	153	9,605
Chromium	Neither	44/50	ND - 12.6	3.03	8.93	1.67	21.5
Cobalt	Neither	27/50	ND - 0.51J	0.147	0.412	0.100	0.583
Copper	Lognormal	39/50	ND - 38.5	2.42	14.2	0.98	11.2
Iron	Neither	50/50	26.3 - 12200J	1,623	6,097	679	14,765
Lead	Lognormal	50/50	0.45 - 38.5J	6.14	21.0	3.94	14,765
Magnesium	Lognormal	43/50	ND - 1610	119	585	49.90	804
Manganese	Lognormal	45/50	ND - 49	6.87	24.3	3.60	43.8
Mercury	Lognormal	25/50	ND - 0.12J	0.0403	0.0961	0.0327	0.120
Nickel	Neither	37/50	ND - 1.8	0.61	1.65	0.350	4.18
Potassium	Lognormal	41/50	ND - 263J	58.09	178	32.1	384
Selenium	Neither	16/50	ND - 3.4	0.28	1.25	0.183	0.819
Silver	Neither	4/50	ND - 1.1	0.0702	0.372	0.049	0.145
Sodium	Neither	1/50	ND - 307	40.46	123	33.4	98.5
Thallium	Neither	0/50	ND	0.180	0.226	0.179	0.223
Vanadium	Lognormal	48/50	ND - 26.2	4.45	14.4	2.44	28.5
Zinc	Lognormal	34/50	ND - 73.9	5.41	28.0	2.18	31.2

TABLE 6-5
STATISTICS SUMMARY FOR INORGANICS IN SUB-SURFACE SOIL
BASE BACKGROUND STUDY
MCB, CAMP LEJEUNE, NORTH CAROLINA

	Distribution	Frequency of Detection	Range	Arithmetic Mean Half Non-Detects	Arithmetic Mean + 2 Standard Deviations	Log Arithmetic Mean Half Non-Detects	Log Arithmetic Mean + 2 Standard Deviations
METALS (mg/kg)							
Aluminum	Neither	50/50	260J - 16800	5,185	13,061	3,715	24,343
Antimony	Neither	14/50	ND - 0.5J	0.180	0.392	0.157	0.419
Arsenic	Neither	19/50	ND - 9.3	1.06	5.29	0.35	4.71
Barium	Lognormal	50/50	0.67J - 27.1	8.28	21.66	5.70	37.34
Beryllium	Lognormal	31/50	ND - 0.91	0.0826	0.358	0.0416	0.432
Cadmium	Neither	0/50	ND	0.012	0.0129	0.0116	0.0130
Calcium	Lognormal	36/50	ND - 4950	221	1,689	51.9	944
Chromium	Lognormal	50/50	0.83 - 23.3	7.25	19.7	5.00	30.9
Cobalt	Neither	36/50	ND - 6.8	0.411	2.33	0.188	1.88
Copper	Lognormal	32/50	ND - 6.7	1.28	4.14	0.691	7.03
Iron	Lognormal	50/50	81.5 - 15600	2,719	10,168	1,287	16,984
Lead	Lognormal	50/50	1 - 12.2J	4.24	9.84	3.49	16,984
Magnesium	Lognormal	49/50	ND - 1250	181	616	103	1,022
Manganese	Neither	50/50	0.57J - 67.6	4.62	23.6	2.80	14.7
Mercury	Lognormal	30/50	ND - 0.16J	0.0355	0.086	0.030	0.096
Nickel	Neither	43/50	ND - 12.3	1.13	4.73	0.58	6.96
Potassium	Lognormal	49/50	ND - 869J	181	621	89.12	1,043
Selenium	Neither	21/50	ND - 1.3	0.252	0.682	0.202	0.70
Silver	Neither	7/50	ND - 0.36J	0.064	0.180	0.054	0.142
Sodium	Neither	0/50	ND	34.2	58.8	31.8	68.0
Thallium	Neither	0/50	ND	0.190	0.215	0.190	0.219
Vanadium	Lognormal	50/50	0.35J - 39	8.60	26.7	5.26	44.7
Zinc	Lognormal	25/50	ND - 39.7	3.29	15.1	1.39	21.5

Table 6-6
Statistics Summary for Inorganics in Shallow Groundwater Samples
Base Background Groundwater Study
MCB Camp Lejeune, North Carolina

	Minimum Detected	Maximum Detected	Frequency of Detection	Arithmatic Mean Half Non-Detects	Standard Deviation	Arithmatic Mean Plus 2 Standard Deviations	Log Arithmatic Mean Half Non-Detects	Log Standard Deviation	Log Arithmatic Mean Plus 2 Standard Deviations
METALS (ug/L	<i>.</i>)								
Aluminum	294	3650	16/24	942.9	1079.8	3102.6	333.6	6.17	346.0
Antimony	0	0	0/24	1.64	0.39	2.42	1.58	1.30	4.18
Arsenic	6.6 J	19	4/24	2.88	4.62	12.1	1.57	2.48	6.54
Barium	9.2 J	143 J	21/24	43.1	33.2	109.4	33.1	2.10	37.31
Beryllium	0	0	0/24	0.15	0.13	0.42	0.13	1.72	3.56
Cadmium	0	0	0/24	0.18	0.03	0.23	0.18	1.15	2.48
Calcium	501 J	176000 J	24/24	34539.2	48613.0	131765.2	11849.0	4.95	11858.9
Chromium	0.66 J	8.4	11/24	1.56	2.10	5.76	0.77	3.25	7.28
Cobalt	0.73 J	5.6 J	10/24	1.70	1.86	5.42	0.95	2.97	6.90
Copper	5.1 J	5.1 J	1/24	1.38	1.86	3.66	1.01	2.23	5.46
Iron	140 J	32700 J	22/24	2999.6	6623.0	16245.5	943.9	5.31	954.5
Lead	1.5 J	4	10/24	1.40	1.10	3.61	1.08	2.03	5.15
Magnesium	728 J	11500	24/24	3181.5	2574.6	8330.7	2416.32	2.12	2420.6
Manganese	4.7 J	359	24/24	106.8	92.2	291.2	66.7	3.10	72.9
Mercury	0	0	0/24	0.05	0	0.05	0.05	1	2.05
Nickel	2 J	16.5 J	15/24	3.99	3.99	12.0	2.25	3.25	8.76
Potassium	677 J	4410	22/24	1638.7	892.0	3422.7	1380.2	1.95	1384.1
Selenium	0	0	0/24	1.57	0.63	2.83	1.46	1.48	4.42
Silver	0.79 J	0.95 J	2/24	0.39	0.18	0.74	0.35	1.49	3.34
Sodium	3370	23000	24/24	11254.2	6674.4	24602.9	9509.1	1.82	9512.7
Thallium	0	0	0/24	1.89	0.96	3.81	1.67	1.67	5.00
Vanadium	0.82 J	11.5 J	11/24	2.36	3.09	8.55	1	4.06	9.11
Zinc	4.6 J	129 J	14/24	21.0	31.04	83.11	8.76	4.06	16.9

U - Not detected.

UJ - Not detected-Quantitation limit is estimated.

J - Analyte present-Report value is estimated.

TABLE 6-7
STATISTICS SUMMARY FOR INORGANICS IN DEEP GROUNDWATER SAMPLES
BASE BACKGROUND GROUNDWATER STUDY
MCB, CAMP LEJEUNE, NORTH CAROLINA

	Minimum Detected	Maximum Detected	Frequency of Detection	Arithmatic Mean Half Non-Detects	Standard Deviation	Arithmatic Mean Plus 2 Standard Deviations	Log Arithmatic Mean Half Non-Detects Converted	Log Standard Deviation Converted	Log Arithmatic Mean Plus 2 Standard Deviations
METALS (ug/L	.)								
Aluminum	283	41800 J	14/24	4015.9	9154.3	22324.5	415.7	11.4	438.4
Antimony	0	0	0/24	1.6	0.4	2.37	1.54	1.28	4.1
Arsenic	2.9 J	28.7 J	5/24	2.6	5.6	13.8	1.46	2.16	5.8
Barium	4.2 J	213 J	20/24	44.6	47.4	139.5	30.6	2.36	35.3
Beryllium	2.2 J	3.2 J	2/24	0.39	0.75	1.89	0.18	2.86	5.9
Cadmium	0.48 J	0.97 J	2/24	0.23	0.17	0.57	0.20	1.51	3.2
Calcium	717 J	384000 J	24/24	51995.7	78980.4	209956.6	17676.7	5.93	17688.5
Chromium	0.85 J	80.8 J	12/24	6.9	16.7	40.2	1.32	6.17	13.7
Cobalt	1.1 J	42.7 J	7/24	3.0	8.6	20.2	0.83	3.56	7.9
Copper	1.3 J	47.4 J	7/24	4.7	8.6	24.4	1.54	3.94	9.4
Iron	193 J	55200 J	22/24	8010.8	14326.4	36663.6	2100.6	7.39	2115.4
Lead	1.1 J	61.7 J	9/24	5.1	12.9	30.9	1.45	3.67	8.8
Magnesium	825 J	18500 J	24/24	3637.5	3745.0	11127.6	2643.9	2.16	2648.2
Manganese	4.7 J	1060 J	24/24	137.1	234.4	605.8	56.3	3.82	63.9
Mercury	0	0	0/24	0.05	0.00	0.05	0.05	1	2.0
Nickel	1.7 J	76.5 J	12/24	6.1	15.6	37.4	1.68	4.26	10.2
Potassium	475 J	8980 J	21/24	2174.3	1935.2	6044.8	1571.8	2.32	1576.5
Selenium	3.8 J	3.8 J	1/24	1.58	0.76	3.10	1.43	1.54	4.5
Silver	0.55 J	0.72 J	2/24	0.35	0.13	0.61	0.33	1.40	3.1
Sodium	4410 J	95300	24/24	16226.3	21139.3	58504.8	11047.9	2.16	11052.3
Thallium	0	0	0/24	1.73	0.91	3.56	1.54	1.62	4.8
Vanadium	0.44 J	107 J	14/24	8.66	21.9	52.4	1.65	6.36	14.4
Zinc	2.1 J	333 J	10/24	32.6	73.6	179.8	6.2	6.05	18.3

U - Not detected

UJ - Not detected - Quantitation limit is estimated

J - Analyte present - Report value is estimated

TABLE 6-8

SUMMARY OF SOIL ANALYTICAL RESULTS HPIA BUILDING 1120 PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

		Comparison Criteria		Concentration Range of Positive Detections		Location of Maximum	Detection	Detections Above Comparison Criteria	
Fraction	Detected Compounds	Base Background	NC Soil to Groundwater Concentrations	Min.	Max.	Detection Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations
Volatile	Cis/trans-1,2-dichloroethene		298.12	2J	2J	1120-IS03-05	1/6		0
Organic	Tetrachloroethene		19.67	5.8	54J	1120-IS02-04	2/6		1
Compounds	Toluene		16,514.72	30	30	1120-IS03-05	1/6		0
(ug/kg)	Trichloroethene		35.72	5.3J	5.3J	1120-IS03-05	1/6		0
	Xylenes, Total		13,667.92	5.7J	5.7J	1120-IS03-05	1/6		0
Metals	Aluminum	17,6000J	NE	300	2,100	1120-IS03-05	3/3	0	NA
Surface Soil	Antimony	0.9J	5.42	0.47J	0.75J	1120-IS03-01	2/3	0	0
(mg/kg)	Arsenic	1.3J	5.24	0.32J	0.6J	1120-IS03-01	3/3	0	0
	Barium	24	848	2	16	1120-IS02-01	3/3	0	0
	Calcium	105,000	NE	400	2,400	1120-IS02-01	3/3	0	NA
	Chromium	12.6	27.2	0.8J	2.2	1120-IS03-01	3/3	0	0
	Cobalt	0.51J	NE	0.09J	0.17J	1120-IS02-01	3/3	0	NA
	Copper	38.5	704	0.082J	0.98J	1120-IS03-01	3/3	0	0
	Iron	12,200J	151.2	63	1,300	1120-IS03-01	3/3	0	2
	Lead	38.5J	270.06	1.2	4.1	1120-IS02-01	3/3	0	0
	Magnesium	1610	NE	11J	58J	1120-IS02-01	3/3	0	NA
	Manganese	49	65.2	1.8	18	1120-IS03-01	3/3	0	0
	Mercury	0.12J	0.014	0.018J	0.032	1120-IS02-01	2/3	0	3
	Nickel	1.8	56.4	0.56J	0.63J	1120-IS02-01	2/3	0	0
	Potassium	263J	NE	16J	51J	1120-IS02-01	3/3	0	NA
	Sodium	307	NE	15J	21J	1120-IS02-01	3/3	0	NA
	Vanadium	26.2	NE	0.58J	3.5	1120-IS03-01	3/3	0	NA
	Zinc	73.9	1,100	1.9J	4.6	1120-IS01-01	2/3	0	0

TABLE 6-8

SUMMARY OF SOIL ANALYTICAL RESULTS HPIA BUILDING 1120 PRELIMINARY ASSESSMENT SITES, CTO - 190

MCB, CAMP LEJEUNE, NORTH CAROLINA

			oarison iteria		ion Range of Detections	Location of Maximum	Detection	-	
Fraction	Detected Compounds	Base Background	NC Soil to Groundwater Concentrations	Min.	Max.	Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations
Metals	Aluminum	16,800	NE	610	1,900	1120-IS01-05	3/3	0	NA
Subsurface	Barium	27.1	848	1.6	3.4	1120-IS01-05	3/3	0	0
Soil	Calcium	4,950	NE	13J	38J	1120-IS02-04,1120-IS01-05	3/3	0	NA
(mg/kg)	Chromium	23.3	27.2	1.2	13	1120-IS01-05	3/3	0	0
	Cobalt	6.8	NE	0.094J	0.25J	1120-IS01-05	3/3	0	NA
	Copper	6.7	704	0.11J	0.59J	1120-IS01-05	3/3	0	0
	Iron	15,600	151.2	120	360	1120-IS01-05	3/3	0	2
	Lead	12.2J	270.06	1.3	2.9	1120-IS01-05	3/3	0	0
	Magnesium	1,250	NE	25J	50J	1120-IS01-05	3/3	0	NA
	Manganese	67.6	65.2	1.3	3	1120-IS01-05	3/3	0	0
	Nickel	12.3	56.4	0.22J	5.8	1120-IS01-05	3/3	0	0
	Potassium	869J	NE	49J	97J	1120-IS01-05	3/3	0	NA
	Sodium	NE	NE	11J	16J	1120-IS04-05	3/3	NA	NA
	Vanadium	NE	NE	1.1	3.1	1120-IS01-05	3/3	NA	NA

Notes:

Volatile organic compounds concentrations presented in micrograms per kilogram ($\mu g/kg$). Metals concentrations are presented in milligrams per kilogram (mg/kg).

NC Soil to = Soil-to-groundwater numbers are based on the current North Carolina Water Quality Standards (North Carolina Administrative Code, Title 15A, Subchapter 2L)

Groundwater or Interim Maximum Allowable Concentrations (IMAC's). If there is no 2L or IMAC, the soil screening number is based on the recommended 2L,

Concentrations or if not available the MCLG. The MCLG is also based on a 10⁻⁶ risk. A total organic carbon value of 4,300 mg/kg was used for the volatile organic compounds.

The default concentrations were used for the metals.

Base = Base Background Study for Metals in soil at Camp Lejeune (Baker, September 2002).

Background

J = Value is estimated NA = Not Applicable NE = Not Established

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS HPIA BUILDING 1120

PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

	D I.G. I		Comparis Criteria			on Range of Detections	Location of Maximum	Detection		Detections Alomparison C	
Fraction	Detected Compounds	NCWQS	MCL	Base Background	Min.	Max.	Detection	Frequency	NCWQS	MCL	Base Background
Volatile	Bromodichloromethane	0.6 (I)	80 (P) *		0.78J	2.4J	1120-TW03	3/3	3	0	
Organic	Chloroform	0.19	80 (P) *		3.4J	8.7	1120-TW02	3/3	3	0	
Compounds	Dibromochlromethane	0.41 (I)	80 (P) *		0.84J	0.84J	1120-TW03	1/3	1	0	
	Trichloroethene	2.8	5		0.65J	0.65J	1120-TW03	1/3	0	0	
Metals	Aluminum	NE	1	41,800 J	640	8,000	1120-TW03	3/3	NA		0
	Barium	2,000		213J	57	8,000	1120-TW01	3/3	0		0
	Beryllium	NE		3.2J	0.11J	0.38J	1120-TW01	3/3	NA		0
	Calcium	NE		384,000J	9,900	29,000	1120-TW01	3/3	NA		0
	Chromium	50		80.8J	2.5J	8.4J	1120-TW03	2/3	0		0
	Cobalt	NE		42.7J	1.6J	1.7J	1120-TW03	2/3	NA		0
	Copper	1,000		47.4J	1.1J	1.8J	1120-TW03	2/3	0		0
	Iron	300		55,200J	170	2,100	1120-TW03	3/3	1		0
	Lead	15		61.7J	2.7J	2.7J	1120-TW03	1/3	0		0
	Magnesium	NE		18,500J	2,500	7,500	1120-TW01	3/3	NA		0
	Manganese	50		1,060J	11	40	1120-TW01	3/3	0		0
	Nickel	100		76.5J	3.2J	3.4J	1120-TW01	2/3	0		0
	Potassium	NE		8,980J	1,700	2,100	1120-TW01	3/3	NA		0
	Sodium	NE		95,300	4,700	12,000	1120-TW01	3/3	NA		0
	Vanadium	NE		107J	2J	11	1120-TW03	3/3	NA		0
	Zinc	2,100	1	333J	2.7J	8J	1120-TW03	3/3	0		0

Notes:

Concentrations presented in micrograms per liter (µg/L).

MCL = Federal Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to users

of public water systems (U.S. Environmental Protection Agency - Drinking Water Regulations and Health Advisories).

NCWQS = North Carolina Water Quality Standards (North Carolina Administrative Code, Title 15A, Subchapter 2L).

(I) = Interim standard or IMAC (Interim Maximum Allowable Concentration)

(P) = Proposed level

* = Total for all THM's combined cannot exceed 80 ug/L (proposed level). The current regulatory level for total

THM's is 100 ug/L)

Base = deep groundwater data from Base Background Study for Metals in Groundwater at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF SOIL ANALYTICAL RESULTS HPIA BUILDING 1409 PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

		_	oarison iteria		on Range of Detections	Location of Maximum	Detection		ons Above son Criteria
Fraction	Detected Compounds	Base Background	NC Soil to Groundwater Concentrations	Min.	Max.	Detection Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations
Volatile Organic	Acetone		2,836.54	3.4J	3.4J	1409-IS02-01	1/6		0
Compounds (ug/kg)									
Semivolatile Organic	bis(2-ethylhexyl)phthalate		28,650.00	810	810	1409-IS03-04	1/6		0
Compounds (ug/kg)									
Metals	Aluminum	17,6000J	NE	1500	4700	1409-IS03-01	3/3	0	NA
Surface Soil	Antimony	0.9J	5.42	0.53J	0.53J	1409-IS03-01	1/3	0	0
(mg/kg)	Arsenic	1.3J	5.24	0.56J	0.77J	1409-IS03-01	2/3	0	0
	Barium	24	848	2.7	11	1409-IS03-01	3/3	0	0
	Calcium	105,000	NE	590	5000	1409-IS03-01	3/3	0	NA
	Chromium	12.6	27.2	1.5	5.2	1409-IS03-01	3/3	0	0
	Cobalt	0.51J	NE	0.087J	0.33J	1409-IS03-01	3/3	0	NA
	Copper	38.5	704	0.38J	1.3J	1409-IS03-01	3/3	0	0
	Iron	12,200J	151.2	390	2400	1409-IS03-01	3/3	0	3
	Lead	38.5J	270.06	2.8	12	1409-IS02-01	3/3	0	0
	Magnesium	1610	NE	37J	220J	1409-IS03-01	3/3	0	NA
	Manganese	49	65.2	2.2	7.3	1409-IS03-01	3/3	0	0
	Mercury	0.12J	0.014	0.014J	0.047J	1409-IS03-01	2/3	0	2
	Nickel	1.8	56.4	0.42J	0.99J	1409-IS03-01	3/3	0	0
	Potassium	263J	NE	35J	160	1409-IS03-01	3/3	0	NA
	Sodium	307	NE	13J	29J	1409-IS02-01,1409-IS03-01	3/3	0	NA
	Vanadium	26.2	NE	1.2	7.3	1409-IS03-01	3/3	0	NA
	Zinc	73.9	1,100	2.5	3.8	1409-IS03-01	2/3	0	0

SUMMARY OF SOIL ANALYTICAL RESULTS HPIA BUILDING 1409 PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

		1	oarison iteria		ion Range of Detections	Location of Maximum	Detection		
Fraction	Detected Compounds	Base Background	NC Soil to Groundwater Concentrations	Min.	Max.	Detection Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations
Metals	Aluminum	16,800	NE	2000	3500	1409-IS01-05	3/3	0	NA
Subsurface	Arsenic	9.3	5.24	0.44J	1.3	1409-IS01-05	3/3	0	0
Soil	Barium	27.1	848	3	4.8	1409-IS01-05	3/3	0	0
(mg/kg)	Calcium	4,950	NE	26J	88	1409-IS01-05	3/3	0	NA
	Chromium	23.3	27.2	3	6.1	1409-IS01-05	3/3	0	0
	Cobalt	6.8	NE	0.16J	0.26J	1409-IS03-05	3/3	0	NA
	Copper	6.7	704	0.18J	0.76J	1409-IS01-05	3/3	0	0
	Iron	15,600	151.2	930	2600	1409-IS01-05	3/3	0	3
	Lead	12.2J	270.06	1.8	4.4	1409-IS03-04	3/3	0	0
	Magnesium	1,250	NE	70J	150J	1409-IS03-04	3/3	0	NA
	Manganese	67.6	65.2	1.3	2.9	1409-IS01-05	3/3	0	0
	Nickel	12.3	56.4	0.37J	0.41J	1409-IS01-05	3/3	0	0
	Potassium	869J	NE	81J	230	1409-IS01-05	3/3	0	NA
	Sodium	NE	NE	20J	26J	1409-IS01-05	3/3	NA	NA
	Vanadium	NE	NE	3.4	9.3	1409-IS01-05	3/3	NA	NA
	Zinc	39.7	1,100	1.5J	1.7J	1409-IS01-05	2/3	0	0

Notes:

Volatile organic compounds concentrations presented in micrograms per kilogram ($\mu g/kg$). Metals concentrations presented in milligrams per kilogram (mg/kg).

NC Soil to Groundwater = Soil-to-groundwater numbers are based on the current North Carolina Water Quality Standards (North Carolina Administrative Code, Title 15A, Subchapter 2L) or Interim Maximum Allowable Concentrations (IMAC's). If there is no 2L or IMAC, the soil screening number is based on the recommended 2L,

Concentrations

or if not available the MCLG. The MCLG is also based on a 10⁻⁶ risk. A total organic carbon value of 4,300 mg/kg was used for the volatile organic compounds.

The default concentrations were used for the metals.

Base = Base Background Study for Metals in soil at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS HPIA BUILDING 1409

PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

	Detected Compounds		Comparis Criteria			ion Range of Detections	Location of Maximum	Detection		Detections Alomparison C	
Fraction	Detected Compounds	NCWQS	MCL	Base Background	Min.	Max.	Detection	Frequency	NCWQS	MCL	Base Background
Volatile	Bromodichloromethane	0.6 (I)	80 (P) *		5.6	5.6	1409-TW01	1/3	1	0	
Organic	Chloroform	0.19	80 (P) *		1.5J	31	1409-TW01	2/3	2	0	
Compounds	Dibromochlromethane	0.41 (I)	80 (P) *		1.3J	1.3J	1409-TW01	1/3	1	0	
Metals	Aluminum	NE		41,800J	460	1,800	1409-TW02	2/3	NA		0
	Barium	2,000		213J	15	68	1409-TW02	3/3	0		0
	Beryllium	NE		3.2J	0.12J	68	1409-TW02	1/3	NA		0
	Calcium	NE		384,000J	14,000	40,000	1409-TW03	3/3	NA		0
	Chromium	50		80.8J	1.1J	2.3J	1409-TW02	2/3	0		0
	Copper	1,000		47.4J	1J	2.3J	1409-TW03	2/3	0		0
	Iron	300		55,200J	73	9,700	1409-TW03	3/3	2		0
	Magnesium	NE		18,500J	1,300	2,800	1409-TW02	3/3	NA		0
	Manganese	50		1,060J	24	120	1409-TW03	3/3	1		0
	Nickel	100		76.5J	3.1J	3.1J	1409-TW03	1/3	0		0
	Potassium	NE		8,980J	1,100	2,300	1409-TW02	3/3	NA		0
	Sodium	NE		95,300	6,700	8,800	1409-TW03	3/3	NA		0
	Vanadium	NE		107J	1.5J	3.6J	1409-TW02	2/3	NA		0
	Zinc	2,100		333J	2.4J	19J	1409-TW03	3/3	0		0

Notes:

Concentrations presented in micrograms per liter (μ g/L).

MCL = Federal Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to users

of public water systems (U.S. Environmental Protection Agency - Drinking Water Regulations and Health Advisories).

NCWQS = North Carolina Water Quality Standards (North Carolina Administrative Code, Title 15A, Subchapter 2L).

(I) = Interim standard or IMAC (Interim Maximum Allowable Concentration)

(P) = Proposed level

* = Total for all THM's combined cannot exceed 80 ug/L (proposed level). The current regulatory level for total

THM's is 100 ug/L)

Base = deep groundwater data from Base Background Study for Metals in Groundwater at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF SOIL ANALYTICAL RESULTS HPIA BUILDING 1512 PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

		Comp	parison	Concentrat	ion Range of			Detecti	ons Above
		Cr	iteria	Positive 1	Detections	Location of Maximum	Detection	Compari	son Criteria
Fraction	Detected Compounds	Base Background	NC Soil to Groundwater Concentrations	Min.	Max.	Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations
Volatile Organic	Acetone		2,836.54	10J	10J	1512-IS03-02	1/6		0
Compounds (ug/kg)									
Semivolatile Organic	Benzo(a)anthracene		1,500	45J	45J	1512-IS02-05	1/6		0
Compounds (ug/kg)	Benzo(a)pyrene		390	74J	74J	1512-IS02-05	1/6		0
	Benzo(b)fluoranthene		4,970	70J	70J	1512-IS02-05	1/6		0
	Benzo(g,h,i)perylene		28,896,800	74J	74J	1512-IS02-05	1/6		0
	Benzo(k)fluoranthene		49,700	66J	66J	1512-IS02-05	1/6		0
	Chrysene		163,970	68J	68J	1512-IS02-05	1/6		0
	Fluoranthene		1,183,450	120J	120J	1512-IS02-05	1/6		0
	Phenanthrene		253,680	44J	44J	1512-IS02-05	1/6		0
	Pyrene		1,228,920	83J	83J	1512-IS02-05	1/6		0
	bis(2-ethylhexyl)phthalate		28,650	260J	440	1512-IS02-05	2/6		0
Metals	Aluminum	16,800	NE	540J	4,200J	1512-IS03-05	6/6	0	NA
Subsurface	Arsenic	9.3	5.24	0.7J	1.9	1512-IS02-04	2/6	0	0
Soil	Barium	27.1	848	3	64	1512-IS01-05	6/6	1	0
(mg/kg)	Beryllium	0.91	3.38	0.013J	0.053J	1512-IS03-05	6/6	0	0
	Cadmium	NE	2.72	0.15J	0.15J	1512-IS01-05	1/6	NA	0
	Calcium	4,950	NE	67	17,000	1512-IS01-05	6/6	1	NA
	Chromium	23.3	27.2	0.66J	6.1	1512-IS02-04	6/6	0	0
	Cobalt	6.8	NE	0.095J	0.11J	1512-IS03-05	2/6	0	NA
	Copper	6.7	704	0.1J	2.9	1512-IS01-05	6/6	0	0
	Iron	15,600	151.2	110J	2,700J	1512-IS02-04	6/6	0	5
	Lead	12.2J	270.06	0.99	29	1512-IS01-05	6/6	1	0
	Magnesium	1,250	NE	21J	290	1512-IS01-05	6/6	0	NA
	Manganese	67.6	65.2	1.4	12	1512-IS01-05	6/6	0	0
	Mercury	0.16J	0.014	0.018J	0.02	1512-IS01-05	2/6	0	2
	Nickel	12.3	56.4	0.3J	0.56J	1512-IS03-05	5/6	0	0
	Potassium	869J	NE	21J	220	1512-IS03-05	6/6	0	NA

SUMMARY OF SOIL ANALYTICAL RESULTS HPIA BUILDING 1512 PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

			oarison iteria	Concentration Rang Positive Detection		Location of Maximum	Detection		ons Above son Criteria
Fraction	Detected Compounds	Base Background	NC Soil to Groundwater Concentrations	Min.	Max.	Detection Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations
Metals (cont.)	Selenium	1.3	12.2	0.35J	0.43J	1512-IS01-03	2/6	0	0
	Vanadium	NE	NE	0.88J	8.4	1512-IS02-04	6/6	NA	NA
	Zinc	39.7	1,100	0.16J	25	1512-IS01-05	6/6	0	0

Notes:

Volatile organic compounds concentrations presented in micrograms per kilogram ($\mu g/kg$). Metals concentrations presented in milligrams per kilogram (mg/kg).

NC Soil to = Soil-to-groundwater numbers are based on the current North Carolina Water Quality Standards (North Carolina Administrative Code, Title 15A, Subchapter 2L)

Groundwater or Interim Maximum Allowable Concentrations (IMAC's). If there is no 2L or IMAC, the soil screening number is based on the recommended 2L,

Concentrations or if not available the MCLG. The MCLG is also based on a 10⁶ risk. A total organic carbon value of 4,300 mg/kg was used for the volatile organic compounds.

The default concentrations were used for the metals.

Base = Base Background Study for Metals in soil at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS HPIA BUILDING 1512

PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

	D 1 G		Comparis Criteria		Concentrati Positive I	on Range of Detections	Location of Maximum	Detection	-	Detections Ab omparison Cr	
Fraction	Detected Compounds	NCWQS	MCL	Base Background	Min.	Max.	Detection	Frequency	NCWQS	MCL	Base Background
Volatile	Bromodichloromethane	0.6 (I)	80 (P) *		0.61J	3.3J	1512-TW02	2/3	2	0	
Organic	Chloroform	0.19	80 (P) *		1.2J	15	1512-TW02	3/3	3	0	
Compounds	Cis/trans-1,2-dichloroethene	70	70		0.88J	0.88J	1512-TW03	1/3	0	0	
	Dibromochlromethane	0.41 (I)	80 (P) *		0.83J	0.83J	1512-TW02	1/3	1	0	
	Toluene	1,000	1,000		2.2J	2.2J	1512-TW03	1/3	0	0	
	Trichloroethene	2.8	5		0.76J	2.2J	1512-TW03	2/3	0	0	
Metals	Aluminum	NE		41,800J	1,400	79,000	1512-TW03	3/3	NA		0
	Arsenic	5		28.7J	11	11	1512-TW03	1/3	1		0
	Barium	2,000		213J	18	220	1512-TW03	3/3	0		0
	Beryllium	NE		3.2J	0.13J	0.96J	1512-TW03	2/3	NA		0
	Calcium	NE		384,000J	5,100	32,000	1512-TW02	3/3	NA		0
	Chromium	50		80.8J	1.5J	64	1512-TW03	3/3	1		0
	Cobalt	NE		42.7J	7.4J	7.4J	1512-TW03	1/3	NA		0
	Copper	1,000		47.4J	1.5J	5.2J	1512-TW03	2/3	0		0
	Iron	300		55,200J	400	16,000	1512-TW03	3/3	3		0
	Lead	15		61.7J	18	18	1512-TW03	1/3	1		0
	Magnesium	NE		18,500J	1,500	3,200	1512-TW03	3/3	NA		0
	Manganese	50		1,060J	9.4J	46	1512-TW03	3/3	0		0
	Nickel	100		76.5J	1.9J	34J	1512-TW03	2/3	0		0
	Potassium	NE		8,980J	1,300	5,400	1512-TW03	3/3	NA		0
	Selenium	50		3.8J	6.2J	11	1512-TW03	2/3	0		2
	Sodium	NE		95,300	5,000	5,600	1512-TW03	3/3	NA		0
	Vanadium	NE		107J	6.8J	66	1512-TW03	3/3	NA		0
	Zinc	2,100		333J	1.7J	28	1512-TW03	3/3	0		0

Notes:

Concentrations presented in micrograms per liter ($\mu g/L$).

MCL = Federal Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to users

of public water systems (U.S. Environmental Protection Agency - Drinking Water Regulations and Health Advisories).

NCWQS = North Carolina Water Quality Standards (North Carolina Administrative Code, Title 15A, Subchapter 2L).

(I) = Interim standard or IMAC (Interim Maximum Allowable Concentration)

(P) = Proposed level

* = Total for all THM's combined cannot exceed 80 ug/L (proposed level). The current regulatory level for total

THM's is 100 ug/L)

Base = deep groundwater data from Base Background Study for Metals in Groundwater at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF SOIL ANALYTICAL RESULTS **BUILDING SAS113** PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

		-	parison iteria		ion Range of Detections	Location of Maximum	Detection		ons Above ison Criteria
Fraction	Detected Compounds	Base Background	NC Soil Screening Level	Min.	Max.	Detection Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations
Volatile Organic	Acetone		2,836.54	15	70	IRP1-SS-IS03-1-3	3/4		0
Compounds (ug/kg)	2- Butanone		17,100	3J	14	IRP1-SS-IS03-1-3	2/4		0
Semivolatile Organic Compounds (ug/kg)	Di-n-octyl phthalate		10,000,000	150J	150J	IRP1-SS-IS04-1-3	1/4		0
Pesticide/	4,4'-DDD		129	2.5J	3.4J	IRP1-SS-IS04-1-3	2/4		0
Polychlorinated	4,4'-DDE		NE	0.89J	1.8J	IRP1-SS-IS04-1-3	3/4		NA
Biphenyls (ug/kg)	beta-BHC		NE	0.68J	0.68J	IRP1-SS-IS01-1-2	1/4		NA
1 7 (8 8)	gamma-Chlordane		NE	0.45J	0.45J	IRP1-SS-IS03-1-3	1/4		NA
Metals	Aluminum	17,600J	NE	2,000	2,260	IRP1-SS-IS02-1-2	4/4	0	NA
Subsurface	Barium	24	848	5.2J	7.4J	IRP1-SS-IS02-1-2	4/4	0	0
Soil	Calcium	105,000	NE	690J	72,000	IRP1-SS-IS03-1-3	4/4	0	NA
(mg/kg)	Chromium	12.6	27.2	2.1J	5.2	IRP1-SS-IS03-1-3	4/4	0	0
	Copper	38.5	704	0.65J	1.4J	IRP1-SS-IS02-1-2	4/4	0	0
	Iron	12,200J	151.2	981	2,360	IRP1-SS-IS03-1-3	4/4	0	4
	Lead	38.5J	270.06	2.8	7.2	IRP1-SS-IS03-1-3	4/4	0	0
	Magnesium	1610	NE	49.5J	1090J	IRP1-SS-IS03-1-3	4/4	0	NA
	Manganese	49	65.2	3.9J	14.4	IRP1-SS-IS03-1-3	4/4	0	0
	Nickel	1.8	56.4	0.49J	0.99J	IRP1-SS-IS03-1-3	4/4	0	0
	Potassium	263J	NE	88.9J	88.9J	IRP1-SS-IS03-1-3	1/4	0	NA
	Sodium	307	NE	161J	161J	IRP1-SS-IS03-1-3	1/4	0	NA
	Vanadium	26.2	NE	2J	4.6J	IRP1-SS-IS03-1-3	4/4	0	NA
	Zinc	73.9	1,100	9.4	9.4	IRP1-SS-IS03-1-3	1/4	0	0

Notes:

Volatile organic compounds concentrations presented in micrograms per kilogram (µg/kg). Metals concentrations presented in milligrams per kilogram (mg/kg).

NC Soil = North Carolina Hazardous Waste Section Soil Screening Level protective of groundwater as calculated and compiled in Guidelines for Establishing Remediation Screening Level

Goals at RCRA Hazardous Waste Sites (NCDENR, May 2005). Base

= Base Background Study for Metals in soil at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS BUILDING SAS113

PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

	D 10		Comparis Criteri			on Range of Detections	Location of Maximum	Detection	_	Detections Al	
Fraction	Detected Compounds	NCWQS	MCL	Base Background	Min.	Max.	Detection	Frequency	NCWQS	MCL	Base Background
Volatile	Carbon disulfide	700	NE		1J	1J	IRP1-GW-IS03-6-10	1/4	0	NA	
Organic											
Compounds											
Semivolatile	Caprolactam	3500	NE		3J	3J	IRP1-GW-IS01-6-10	2/4	0	NA	
Organic											
Compounds											
Pesticide/	beta-BHC	0.019 (*)	NE		0.028	0.028	IRP1-GW-IS01-6-10	1/4	1	NA	
Polychlorinated											
Biphenyls											
Metals	Aluminum	NE		3,650	3,000	45,000	IRP1-GW-IS03-6-10	4/4	NA		3
	Arsenic	5		19	5.3J	18.9	IRP1-GW-IS03-6-10	3/4	3		0
	Barium	2,000		143J	68.1J	181J	IRP1-GW-IS03-6-10	4/4	0		1
	Beryllium	NE		0	0.48J	1.1J	IRP1-GW-IS03-6-10	2/4	NA		2
	Calcium	NE		176,000J	4280J	7,210	IRP1-GW-IS03-6-10	4/4	NA		0
	Chromium	50		8.4	17.1	67.4	IRP1-GW-IS03-6-10	4/4	1		4
	Cobalt	NE		5.6J	1.6J	11.1J	IRP1-GW-IS03-6-10	4/4	NA		2
	Copper	1,000		5.1J	3.4J	11.9J	IRP1-GW-IS03-6-10	4/4	0		1
	Iron	300		32,700J	10500	33,100	IRP1-GW-IS03-6-10	4/4	4		1
	Lead	15		4	5.1	40.5	IRP1-GW-IS03-6-10	4/4	1		4
	Magnesium	NE		11,500	709J	2400J	IRP1-GW-IS03-6-10	4/4	NA		0
	Manganese	50		359	41.7	130	IRP1-GW-IS03-6-10	4/4	3		0
	Nickel	100		16.5J	12.8J	40.5	IRP1-GW-IS04-6-10	4/4	0		3
	Potassium	NE		4,410	1070J	3590J	IRP1-GW-IS03-6-10	4/4	NA		0
	Sodium	NE		23,000	6,330	14,100	IRP1-GW-IS03-6-10	4/4	NA		0
	Vanadium	NE		11.5J	8.4J	71.3	IRP1-GW-IS03-6-10	4/4	NA		3
	Zinc	2,100		129J	56.8	834	IRP1-GW-IS03-6-10	4/4	0		3

Notes:

Concentrations presented in micrograms per liter (µg/L).

MCL = Federal Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to users

of public water systems (U.S. Environmental Protection Agency - Drinking Water Regulations and Health Advisories).

NCWQS = North Carolina Water Quality Standards (North Carolina Administrative Code, Title 15A, Subchapter 2L).

(*) = NCWQS for BHC

Base = shallow groundwater data from Base Background Study for Metals in Groundwater at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF SOIL ANALYTICAL RESULTS BUILDING AS116 PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

			parison iteria		on Range of Detections	Location of Maximum	Detection		ons Above son Criteria
Fraction	Detected Compounds	Base Background	NC Soil Screening Level	Min.	Max.	Detection Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations
Volatile Organic	Acetone		2,836.54	21	73	IRP2-SS-IS02-1-2	2/4		0
Compounds (ug/kg)	Methylene Chloride		20	3J	3J	IRP2-SS-IS04-1-3	1/4		0
Semivolatile Organic	bis(2-ethylhexyl)phthalate		5,560	470	840	IRP2-SS-IS02-1-2	2/4		0
Compounds (ug/kg)	Di-n-octyl phthalate		10,000,000	130J	130J	IRP2-SS-IS02-1-2	1/4		0
Pesticide/	4,4'-DDD		129	0.8J	6.2	IRP2-SS-IS02-1-2	3/4		0
Polychlorinated	4,4'-DDE		NE	1.2J	4.9	IRP2-SS-IS02-1-2	4/4		NA
Biphenyls (ug/kg)	beta-BHC		NE	0.6J	3J	IRP2-SS-IS02-1-2	4/4		NA
	Endosulfan II		NE	1.1J	1.1J	IRP2-SS-IS04-1-3	1/4		NA
	Endrin		440	1J	1J	IRP2-SS-IS04-1-3	1/4		0
	Endrin ketone		NE	2.7J	2.7J	IRP2-SS-IS02-1-2	1/4		NA
	gamma-Chlordane		NE	0.74J	0.74J	IRP2-SS-IS02-1-2	1/4		NA
	Heptachlor epoxide		6.34	0.55J	0.98J	IRP2-SS-IS02-1-2	2/4		0
Metals	Aluminum	17,600J	NE	1,670	4,040	IRP2-SS-IS04-1-3	4/4	0	NA
(mg/kg)	Barium	24	848	4.6J	9.1J	IRP2-SS-IS04-1-3	4/4	0	0
	Beryllium	0.53J	3.38	0.075J	0.075J	IRP2-SS-IS04-1-3	1/4	0	0
	Calcium	105,000	NE	343J	2750J	IRP2-SS-IS02-1-2	4/4	0	NA
	Chromium	12.6	27.2	1.6J	4	IRP2-SS-IS04-1-3	4/4	0	0
	Copper	38.5	704	0.43J	0.97J	IRP2-SS-IS02-1-2	4/4	0	0
	Iron	12,200J	151.2	834	1310	IRP2-SS-IS02-1-2	4/4	0	4
	Lead	38.5J	270.06	2.5	5.3	IRP2-SS-IS03-1-3	4/4	0	0
	Magnesium	1,610	NE	39.4J	128J	IRP2-SS-IS04-1-3	4/4	0	NA
	Manganese	49	65.2	2.9J	4.3J	IRP2-SS-IS02-1-2	4/4	0	0
	Nickel	1.8	56.4	0.36J	1.2J	IRP2-SS-IS01-2-3	4/4	0	0
	Sodium	307	NE	62.2J	62.2J	IRP2-SS-IS02-1-2	1/4	0	NA
	Vanadium	26.2	NE	1.8J	4.3J	IRP2-SS-IS04-1-3	4/4	0	NA

Notes:

Volatile organic compounds concentrations presented in micrograms per kilogram ($\mu g/kg$). Metals concentrations presented in milligrams per kilogram (mg/kg).

NC Soil = North Carolina Hazardous Waste Section Soil Screening Level protective of groundwater as calculated and compiled in Guidelines for Establishing Remediation

Screening Level Goals at RCRA Hazardous Waste Sites (NCDENR, May 2005).

Base = Base Background Study for Metals in soil at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

BUILDING AS116

PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

	Detected Compounds		Comparis Criteri			on Range of Detections	Location of Maximum	Detection		Detections Al omparison Ci	
Fraction	Detected Compounds	NCWQS	MCL	Base Background	Min.	Max.	Detection	Frequency	NCWQS	MCL	Base Background
Volatile	Carbon disulfide	700	NE		1J	1J	IRP2-GW-IS02-6-10	1/4	0	NA	
Organic	Methyl-tert-butyl ether	200	NE		16	16	IRP2-GW-IS02-6-10	1/4	0	NA	
Compounds	Toluene	1000	1000		0.8J	0.8J	IRP2-GW-IS03-6-10	1/4	0	0	
	Xylene (total)	530	10000		7J	7J	IRP2-GW-IS03-6-10	1/4	0	0	
Semivolatile	bis(2-ethylhexyl)phthalate	2.5	6		11	11	IRP2-GW-IS02-6-10	1/4	1	1	
Organic	Caprolactam	3500	NE		4J	11	IRP2-GW-IS02-6-10	2/4	0	NA	
Compounds	Pentachlorophenol	0.29	1		7J	7J	IRP2-GW-IS02-6-10	1/4	1	1	
Pesticide/	alpha-Chlordane	0.1 (*)	2(*)		0.01J	0.01J	IRP2-GW-IS03-6-10	1/4	0	0	
Polychlorinated											
Biphenyls											
Metals	Aluminum	NE		3,650	19,300	242,000J	IRP2-GW-IS02-6-10	4/4	NA		4
	Arsenic	5		19	16.2	35.2	IRP2-GW-IS02-6-10	4/4	4		1
	Barium	2,000		143J	82.6J	488	IRP2-GW-IS02-6-10	4/4	0		1
	Beryllium	NE		0	0.47J	3.6J	IRP2-GW-IS02-6-10	4/4	NA		4
	Cadmium	1.75		0	1.1J	1.8J	IRP2-GW-IS02-6-10	2/4	1		2
	Calcium	NE		176,000J	2700J	22,500	IRP2-GW-IS01-7-11	4/4	NA		0
	Chromium	50		8.4	42.4	277	IRP2-GW-IS02-6-10	4/4	1		4
	Cobalt	NE		5.6J	2.4J	17.4J	IRP2-GW-IS03-6-10	4/4	NA		3
	Copper	1,000		5.1J	7.9J	60.6	IRP2-GW-IS02-6-10	4/4	0		4
	Iron	300		32,700J	23600	109,000	IRP2-GW-IS01-7-11	4/4	4		2
	Lead	15		4	28	165	IRP2-GW-IS02-6-10	4/4	4		4
	Magnesium	NE		11,500	939J	8,240	IRP2-GW-IS02-6-10	4/4	NA		0
	Manganese	50		359	78	176	IRP2-GW-IS02-6-10	4/4	0		0
	Mercury	1.1		0	0.35	0.35	IRP2-GW-IS02-6-10	1/4	0		1
	Nickel	100		16.5J	22.3J	59.8	IRP2-GW-IS02-6-10	4/4	0		4
	Potassium	NE		4,410	1560J	9,590	IRP2-GW-IS02-6-10	4/4	NA		1
	Sodium	NE		23,000	5,300	14,500	IRP2-GW-IS01-7-11	4/4	NA		0
	Vanadium	NE		11.5J	37J	287	IRP2-GW-IS02-6-10	4/4	NA		4
	Zinc	2,100		129J	99	207	IRP2-GW-IS02-6-10	4/4	0		3

Notes:

Concentrations presented in micrograms per liter ($\mu g/L$).

MCL = Federal Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to users

of public water systems (U.S. Environmental Protection Agency - Drinking Water Regulations and Health Advisories).

NCWQS = North Carolina Water Quality Standards (North Carolina Administrative Code, Title 15A, Subchapter 2L).

(*) = NCWQS or MCL for chlordane

Base = shallow groundwater data from Base Background Study for Metals in Groundwater at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF SOIL ANALYTICAL RESULTS BUILDING AS119 PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

		Comp. Cri	arison teria	Concentrati Positive I	on Range of Detections		Detection		ons Above son Criteria
Fraction	Detected Compounds	Base Background	NC Soil Screening Level	Min.	Max.	Location of Maximum Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations
Volatile Organic	4-methyl-2-pentanone		8,125	9	9	IRP3-SS-IS03-0-3	1/4		0
Compounds (ug/kg)	Acetone		2,836.54	21	21	IRP3-SS-IS04-1-3	1/4		0
	Methylene chloride		20	2	3	IRP3-SS-IS04-1-3	2/4		0
Semivolatile Organic	Anthracene		995,000	150J	150J	IRP3-SS-IS02-2-3	1/4		0
Compounds (ug/kg)	Benzo(a)anthracene		343	1000	1000	IRP3-SS-IS02-2-3	1/4		1
	Benzo(a)pyrene		92.8	780	780	IRP3-SS-IS02-2-3	1/4		0
	Benzo(b)fluoranthene		1,180	770	770	IRP3-SS-IS02-2-3	1/4		0
	Benzo(g,h,i)perylene		6,720,000	170J	170J	IRP3-SS-IS02-2-3	1/4		0
	Benzo(k)fluoranthene		11,800	810	810	IRP3-SS-IS02-2-3	1/4		0
	bis(2-ethylhexyl)phthalate		5,560	430	430	IRP3-SS-IS03-0-3	1/4		0
	Caprolactam		NE	97J	97J	IRP3-SS-IS01-1-2	1/4		NA
	Chrysene		38,200	1100	1100	IRP3-SS-IS02-2-3	1/4		0
	dibenzo(a,h)anthracene		172	220J	220J	IRP3-SS-IS02-2-3	1/4		1
	Fluoranthene		276,000	1800	1800	IRP3-SS-IS02-2-3	1/4		0
	indeno(1,2,3-cd)pyrene		3,320	440	440	IRP3-SS-IS02-2-3	1/4		0
	Phenanthrene		59,600	870	870	IRP3-SS-IS02-2-3	1/4		0
	Pyrene		286,000	2000	2000	IRP3-SS-IS02-2-3	1/4		0
Pesticide/	4,4'-DDD		129	3.6J	140	IRP3-SS-IS02-2-3	3/4		1
Polychlorinated	4,4'-DDE			0.86J	56	IRP3-SS-IS02-2-3	4/4		NA
Biphenyls (ug/kg)	4,4'-DDT		1360	1.1J	1.9J	IRP3-SS-IS02-2-3	2/4		0
	beta-BHC			0.97J	3.3J	IRP3-SS-IS02-2-3;IRP3-SS-IS03-0-	4/4		NA
	delta-BHC			1J	1J	IRP3-SS-IS03-0-3	1/4		NA
	Dieldrin		1.13	2.6J	2.6J	IRP3-SS-IS01-1-2	1/4		0
	Endrin aldehyde			1.2J	1.2J	IRP3-SS-IS02-2-3	1/4		NA
	gamma-BHC (lindane)		6.2	0.4J	0.4J	IRP3-SS-IS03-0-3	1/4		0
	gamma-Chlordane			0.49J	0.49J	IRP3-SS-IS04-1-3	1/4		NA
Metals	Aluminum	17,600J	NE	1,710	3,690	IRP3-SS-IS03-0-3	4/4	0	NA
(mg/kg)	Arsenic	1.3J	5.24	0.87J	0.87J	IRP3-SS-IS03-0-3	1/4	0	0
	Barium	24	848	4.8J	9.6J	IRP3-SS-IS02-2-3	4/4	0	0
	Cadmium	0.11J	0.95	0.088J	0.088J	IRP3-SS-IS03-0-3	1/4	0	0
	Calcium	105,000	NE	419J	12,300J	IRP3-SS-IS04-1-3	4/4	0	NA
	Chromium	12.6	27.2	3	6	IRP3-SS-IS03-0-3	4/4	0	0
	Copper	38.5	704	0.52J	1.8J	IRP3-SS-IS02-2-3	4/4	0	0

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SUMMARY OF SOIL ANALYTICAL RESULTS BUILDING AS119

PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

	Detected Compounds	Comparison Criteria		Concentration Range of Positive Detections			Detection	Detections Above Comparison Criteria	
Fraction		Base Background	NC Soil Screening Level	Min.	Max.	Location of Maximum Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations
	Iron	12,200J	151.2	992	3260	IRP3-SS-IS03-0-3	4/4	0	4
	Lead	38.5J	270.06	2.7	13.7	IRP3-SS-IS02-2-3	4/4	0	0
Metals (cont.)	Magnesium	1,610	NE	97.2J	264J	IRP3-SS-IS04-1-3	4/4	0	NA
	Manganese	49	65.2	4.2J	10.4J	IRP3-SS-IS04-1-3	4/4	0	0
	Nickel	1.8	56.4	0.37J	0.8J	IRP3-SS-IS01-1-2	4/4	0	0
	Potassium	263J	NE	79.3J	177J	IRP3-SS-IS03-0-3	2/4	0	NA
	Sodium	307	NE	69.1J	69.1J	IRP3-SS-IS03-0-3	1/4	0	NA
	Vanadium	26.2	NE	3.5J	9.1J	IRP3-SS-IS03-0-3	4/4	0	NA
	Zinc	73.9	1,100	5	6	IRP3-SS-IS01-1-2;IRP3-SS-IS03-0-	3/4	0	0

Notes:

Volatile organic (=

Metals concentrations presented in milligrams per kilogram (mg/kg).

NC Soil = North Carolina Hazardous Waste Section Soil Screening Level protective of groundwater as calculated and compiled in Guidelines for Establishing Remediation

Screening Level Goals at RCRA Hazardous Waste Sites (NCDENR, May 2005).

Base = Base Background Study for Metals in soil at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS BUILDING AS119

PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

	Detected Commercial	Comparison Criteria				on Range of Detections	Location of Maximum	Detection	Detections Above Comparison Criteria		
Fraction	Detected Compounds	NCWQS	MCL	Base Background	Min.	Max.	Detection	Frequency	NCWQS	MCL	Base Background
Volatile	Chloroform	70	80 (P)		2J	2J	IRP3-GW-IS03-6-10	1/4	0	0	
Organic	Methylene chloride	4.6	5		2J	2J	IRP3-GW-IS01-6-10	1/4	0	0	
Compounds	Toluene	1000	1000		1J	1J	IRP3-GW-IS03-6-10	1/4	0	0	
Semivolatile	bis(2-ethylhexyl)phthalate	2.5	6		11	11	IRP3-GW-IS01-6-10	1/4	1	1	
Organic	Caprolactam	3500	NE		2J	3J	IRP3-GW-IS01-6-10	2/4	0	NA	
Compounds						3J					
Pesticide/	beta-BHC	0.019 (*)	NE		0.019J	0.019J	IRP3-GW-IS02-6-10	1/4	0	NA	
Polychlorinated	delta-BHC	0.019 (*)	NE		0.014J	0.014J	IRP3-GW-IS03-6-10	1/4	0	NA	
Biphenyls											
Metals	Aluminum	NE		3,650	558	102,000J	IRP3-GW-IS01-6-10	4/4	NA		2
	Arsenic	5		19	3J	11.2	IRP3-GW-IS01-6-10	3/4	2		0
	Barium	2,000		143J	86.2J	350	IRP3-GW-IS01-6-10	4/4	0		3
	Beryllium	NE		0	1.5J	1.5J	IRP3-GW-IS01-6-10	1/4	NA		1
	Cadmium	1.75		0	0.85J	0.85J	IRP3-GW-IS01-6-10	1/4	0		1
	Calcium	NE		176,000J	20,900	88,200	IRP3-GW-IS04-6-10	4/4	NA		0
	Chromium	50		8.4	6.6J	112	IRP3-GW-IS01-6-10	3/4	1		2
	Cobalt	NE		5.6J	1J	3.3J	IRP3-GW-IS01-6-10	3/4	NA		0
	Copper	1,000		5.1J	2.5J	17.2J	IRP3-GW-IS01-6-10	3/4	0		1
	Iron	300		32,700J	8720	45,500	IRP3-GW-IS01-6-10	4/4	4		2
	Lead	15		4	3.9	65.1	IRP3-GW-IS01-6-10	3/4	1		2
	Magnesium	NE		11,500	2710J	11,100	IRP3-GW-IS02-6-10	4/4	NA		0
	Manganese	50		359	83	268	IRP3-GW-IS02-6-10	4/4	4		0
	Mercury	1.1		0	0.26	0.33	IRP3-GW-IS03-6-10	2/4	0		2
	Nickel	100		16.5J	6.6J	51.1	IRP3-GW-IS02-6-10	4/4	0		3
	Potassium	NE		4,410	4220J	11,600	IRP3-GW-IS01-6-10	4/4	NA		3
	Sodium	NE		23,000	4830J	27,700	IRP3-GW-IS03-6-10	4/4	NA		1
	Vanadium	NE		11.5J	2.2J	143	IRP3-GW-IS01-6-10	4/4	NA		2
	Zinc	2,100		129J	55	297	IRP3-GW-IS02-6-10	4/4	0		3

Notes:

Concentrations presented in micrograms per liter ($\mu g/L$).

MCL = Federal Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to users

of public water systems (U.S. Environmental Protection Agency - Drinking Water Regulations and Health Advisories).

NCWQS = North Carolina Water Quality Standards (North Carolina Administrative Code, Title 15A, Subchapter 2L).

(P) = Proposed level (*) = NCWQS for BHC

Base = shallow groundwater data from Base Background Study for Metals in Groundwater at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF SOIL ANALYTICAL RESULTS BUILDING M119 PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

			parison iteria		ion Range of Detections	Location of Maximum	Detection		ons Above ison Criteria
Fraction	Detected Compounds	Base Background	NC Soil Screening Level	Min.	Max.	Detection Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations
Volatile Organic	Methylene Chloride		20	3J	3J	IRP4-SS-IS04-0-3	1/4		0
Compounds (ug/kg)									
Semivolatile Organic	bis(2-ethylhexyl)phthalate		5,560	140J	140J	IRP4-SS-IS01-0-3	1/4		0
Compounds (ug/kg)	Di-n-octyl phthalate		10,000,000	610J	610J	IRP4-SS-IS01-0-3	1/4		0
Pesticide/	4,4'-DDD		129	1.4J	1.4J	IRP4-SS-IS04-0-3	1/4		0
Polychlorinated	4,4'-DDE			120J	120J	IRP4-SS-IS04-0-3	1/4		NA
Biphenyls (ug/kg)	4,4'-DDT		1360	52J	52J	IRP4-SS-IS04-0-3	1/4		0
	alpha-Chlordane			2.6J	2.6J	IRP4-SS-IS04-0-3	1/4		NA
	beta-BHC			0.61J	0.8J	IRP4-SS-IS03-1-3	2/4		NA
	Endrin		440	1.4J	1.4J	IRP4-SS-IS04-0-3	1/4		0
	gamma-Chlordane			2.1J	2.1J	IRP4-SS-IS04-0-3	1/4		NA
Metals	Aluminum	17,600J	NE	2,350	4,350	IRP4-SS-IS01-0-3	4/4	0	NA
(mg/kg)	Arsenic	1.3J	5.24	0.55J	0.67J	IRP4-SS-IS01-0-3	2/4	0	0
	Barium	24	848	4.7J	19.7J	IRP4-SS-IS04-0-3	4/4	0	0
	Calcium	105,000	NE	758J	2,470J	IRP4-SS-IS04-0-3	4/4	0	NA
	Chromium	12.6	27.2	1.5J	3.2	IRP4-SS-IS01-0-3	4/4	0	0
	Cobalt	0.51J	NE	0.19J	0.19J	IRP4-SS-IS01-0-3	1/4	0	NA
	Copper	38.5	704	0.64J	2J	IRP4-SS-IS04-0-3	4/4	0	0
	Iron	12,200J	151.2	977	2260	IRP4-SS-IS01-0-3	4/4	0	4
	Lead	38.5J	270.06	2	14.8	IRP4-SS-IS04-0-3	4/4	0	0
	Magnesium	1,610	NE	62.2J	122J	IRP4-SS-IS01-0-3	4/4	0	NA
	Manganese	49	65.2	4.1J	8.9J	IRP4-SS-IS04-0-3	4/4	0	0
	Nickel	1.8	56.4	0.61J	1J	IRP4-SS-IS01-0-3	4/4	0	0
	Potassium	263J	NE	78.8J	78.8J	IRP4-SS-IS01-0-3	1/4	0	NA
	Vanadium	26.2	NE	2.4J	5.6J	IRP4-SS-IS01-0-3	4/4	0	NA
	Zinc	73.9	1,100	18.9	18.9	IRP4-SS-IS04-0-3	1/4	0	0

Notes:

Volatile organic compounds concentrations presented in micrograms per kilogram (µg/kg).

Metals concentrations presented in milligrams per kilogram (mg/kg).

NC Soil = North Carolina Hazardous Waste Section Soil Screening Level protective of groundwater as calculated and compiled in Guidelines for Establishing Remediation

Screening Level Goals at RCRA Hazardous Waste Sites (NCDENR, May 2005).

Base = Base Background Study for Metals in soil at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS BUILDING M119

PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

	Detected Compounds	Comparison Criteria			Concentration Range of Positive Detections		Location of Maximum	Detection		Detections Ab omparison Cr	
Fraction	Detected Compounds	NCWQS	MCL	Base Background	Min.	Max.	Detection	Frequency	NCWQS	MCL	Base Background
Volatile	Ethylbenzene	29	700		1J	1J	IRP4-GW-IS03-12-16	1/4	0	0	
Organic	Toluene	1000	1000		1J	1J	IRP4-GW-IS03-12-16	1/4	0	0	
Compounds	Xylene (total)	530	10000		15	15	IRP4-GW-IS03-12-16	1/4	0	0	
Pesticide/	beta-BHC	0.019 (*)	NE		0.013J	0.013J	IRP4-GW-IS02-12-16	1/4	0	NA	
Polychlorinated	delta-BHC	0.019 (*)	NE		0.01J	0.01J	IRP4-GW-IS02-12-16	1/4	0	NA	
Biphenyls						0.01J					
Metals	Aluminum	NE		3,650	935J	8750J	IRP4-GW-IS01-12-16	4/4	NA		2
	Barium	2,000		143J	51.4J	166J	IRP4-GW-IS04-14-18	4/4	0		1
	Beryllium	NE		0	0.44J	0.44J	IRP4-GW-IS04-14-18	1/4	NA		1
	Calcium	NE		176,000J	1750J	12,800	IRP4-GW-IS04-14-18	4/4	NA		0
	Chromium	50		8.4	1.3J	26.2	IRP4-GW-IS01-12-16	3/4	0		1
	Cobalt	NE		5.6J	0.7J	2.2J	IRP4-GW-IS04-14-18	4/4	NA		0
	Copper	1,000		5.1J	2.5J	4.7J	IRP4-GW-IS01-12-16	2/4	0		0
	Iron	300		32,700J	1610	8,720	IRP4-GW-IS01-12-16	4/4	4		0
	Lead	15		4	1.4J	8.6	IRP4-GW-IS01-12-16	3/4	0		1
	Magnesium	NE		11,500	1950J	10,700	IRP4-GW-IS04-14-18	4/4	NA		0
	Manganese	50		359	19.8	74.8	IRP4-GW-IS04-14-18	4/4	1		0
	Nickel	100		16.5J	10.1J	22.9J	IRP4-GW-IS03-12-16	4/4	0		2
	Potassium	NE		4,410	1000J	1830J	IRP4-GW-IS01-12-16	4/4	NA		0
	Sodium	NE		23,000	8,320	23,600	IRP4-GW-IS02-12-16	4/4	NA		1
	Vanadium	NE		11.5J	0.91J	12.4J	IRP4-GW-IS01-12-16	3/4	NA		1
	Zinc	2,100		129J	103	322	IRP4-GW-IS01-12-16	4/4	0		3

Notes:

Concentrations presented in micrograms per liter (µg/L).

MCL = Federal Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to users

 $of \ public \ water \ systems \ (U.S.\ Environmental\ Protection\ Agency\ -\ Drinking\ Water\ Regulations\ and\ Health\ Advisories).$

NCWQS = North Carolina Water Quality Standards (North Carolina Administrative Code, Title 15A, Subchapter 2L).

(*) = NCWQS for BHC

Base = shallow groundwater data from Base Background Study for Metals in Groundwater at Camp Lejeune (Baker, September 2002).

Background

SUMMARY OF SOIL ANALYTICAL RESULTS **BUILDING M315** PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

	Detected Compounds		parison iteria		ion Range of Detections	Location of Maximum	Detection	Detections Above Comparison Criteria		
Fraction		Base Background	NC Soil Screening Level	Min.	Max.	Detection Detection	Frequency	Base Background	NC Soil to Groundwater Concentrations	
Volatile Organic	Methylene Chloride		20	2J	4J	IRP5-SS-IS04-0-3	2/5		0	
Compounds (ug/kg)										
Semivolatile Organic Compounds (ug/kg)	bis(2-ethylhexyl)phthalate		5,560	83J	150J	IRP5-SS-IS01-0-3	2/5		0	
Pesticide/	4,4'-DDE			0.86J	68	IRP5-SS-IS01-0-3	5/5		NA	
Polychlorinated	4,4'-DDT		1,360	2J	41	IRP5-SS-IS01-0-3	3/5		0	
Biphenyls (ug/kg)	alpha-Chlordane			0.56J	14J	IRP5-SS-IS01-0-3	3/5		NA	
	beta-BHC			0.64J	1.1J	IRP5-SS-IS02-0-4	2/5		NA	
	Endrin ketone			0.96J	0.96J	IRP5-SS-IS01-0-3	1/5		NA	
	gamma-Chlordane			0.57J	8.2	IRP5-SS-IS01-0-3	3/5		NA	
	Heptachlor epoxide		6.34	0.65J	1.2J	IRP5-SS-IS01-0-3	2/5		0	
Metals	Aluminum	17,600J	NE	1,710	3,590	IRP5-SS-IS02-0-4	5/5	0	NA	
(mg/kg)	Arsenic	1.3J	5.24	0.95J	0.95J	IRP5-SS-IS03-DUP-0-3	1/5	0	0	
	Barium	24	848	6.3J	10.6J	IRP5-SS-IS03-0-3	5/5	0	0	
	Calcium	105,000	NE	429J	995J	IRP5-SS-IS04-0-3	5/5	0	NA	
	Chromium	12.6	27.2	1.4J	4	IRP5-SS-IS02-0-4	5/5	0	0	
	Cobalt	0.51J	NE	0.19J	0.2J	IRP5-SS-IS02-0-4	2/5	0	NA	
	Copper	38.5	704	0.74J	3.1J	IRP5-SS-IS02-0-4	5/5	0	0	
	Iron	12,200J	151.2	667	1830	IRP5-SS-IS03-DUP-0-3	5/5	0	5	
	Lead	38.5J	270.06	3.2	29	IRP5-SS-IS01-0-3	5/5	0	0	
	Magnesium	1,610	NE	50.8J	94.5J	IRP5-SS-IS02-0-4	5/5	0	NA	
	Manganese	49	65.2	3.1J	8.6J	IRP5-SS-IS01-0-3	5/5	0	0	
	Nickel	1.8	56.4	0.6J	1.2J	IRP5-SS-IS01-0-3	5/5	0	0	
	Potassium	263J	NE	60.1J	110J	IRP5-SS-IS02-0-4	2/5	0	NA	
	Vanadium	26.2	NE	2J	5.4J	IRP5-SS-IS02-0-4	5/5	0	NA	
	Zinc	73.9	1,100	5.2	23.2	IRP5-SS-IS01-0-3	3/5	0	0	

Notes:

Volatile organic compounds concentrations presented in micrograms per kilogram ($\mu g/kg$). Metals concentrations presented in milligrams per kilogram (mg/kg).

NC Soil = North Carolina Hazardous Waste Section Soil Screening Level protective of groundwater as calculated and compiled in Guidelines for Establishing Remediation

Goals at RCRA Hazardous Waste Sites (NCDENR, May 2005). Screening Level Base

= Base Background Study for Metals in soil at Camp Lejeune (Baker, September 2002).

Background

${\bf SUMMARY\ OF\ GROUNDWATER\ ANALYTICAL\ RESULTS}$

BUILDING M315

PRELIMINARY ASSESSMENT SITES, CTO - 190 MCB, CAMP LEJEUNE, NORTH CAROLINA

Fraction	Detected Compounds	Comparison Criteria				ion Range of Detections	Location of Maximum	Detection	Detections Above Comparison Criteria		
		NCWQS	MCL	Base Background	Min.	Max.	Detection	Frequency	NCWQS	MCL	Base Background
Semivolatile Organic Compounds	bis(2-ethylhexyl)phthalate	2.5	6		4J	4J	IRP5-GW-IS01-16-20	1/4	1	0	
Pesticide/ Polychlorinated Biphenyls	beta-BHC	0.019 (*)	NE		0.014J	0.014J	IRP5-GW-IS01-16-20	1/4	0	NA	
Metals	Aluminum	NE		3,650	583J	26,600J	IRP5-GW-IS02-16-20	4/4	NA		1
	Arsenic	5		19	4.9J	7.3J	IRP5-GW-IS04-15-19	2/4	1		0
	Barium	2,000		143J	61.2J	82.1J	IRP5-GW-IS02-16-20	4/4	0		0
	Beryllium	NE		0	0.36J	0.91J	IRP5-GW-IS02-16-20	2/4	NA		2
	Cadmium	1.75		0	0.56J	0.56J	IRP5-GW-IS04-15-19	1/4	0		1
	Calcium	NE		176,000J	898J	2010J	IRP5-GW-IS03-16-20	4/4	NA		0
	Chromium	50		8.4	4.9J	47.3	IRP5-GW-IS02-16-20	3/4	0		2
	Cobalt	NE		5.6J	0.92J	2.1J	IRP5-GW-IS04-15-19	4/4	NA		0
	Copper	1,000		5.1J	4.2J	16.9J	IRP5-GW-IS02-16-20	2/4	0		1
	Iron	300		32,700J	1500	9,820	IRP5-GW-IS02-16-20	4/4	4		0
	Lead	15		4	3.3	16.7	IRP5-GW-IS02-16-20	2/4	1		1
	Magnesium	NE		11,500	1070J	2460J	IRP5-GW-IS04-15-19	4/4	NA		0
	Manganese	50		359	17.3	46.9	IRP5-GW-IS02-16-20	4/4	0		0
	Nickel	100		16.5J	16.9J	30.1J	IRP5-GW-IS01-16-20	4/4	0		4
	Potassium	NE		4,410	841J	2670J	IRP5-GW-IS02-16-20	4/4	NA		0
	Sodium	NE		23,000	5,740	6,990	IRP5-GW-IS01-16-20	4/4	NA		0
	Vanadium	NE		11.5J	2.5J	26.7J	IRP5-GW-IS02-16-20	3/4	NA		1
	Zinc	2,100		129J	84.5	238	IRP5-GW-IS04-15-19	4/4	0		1

Notes:

Concentrations presented in micrograms per liter (μ g/L).

MCL = Federal Maximum Contaminant Level. Maximum permissible level of a contaminant in water which is delivered to users

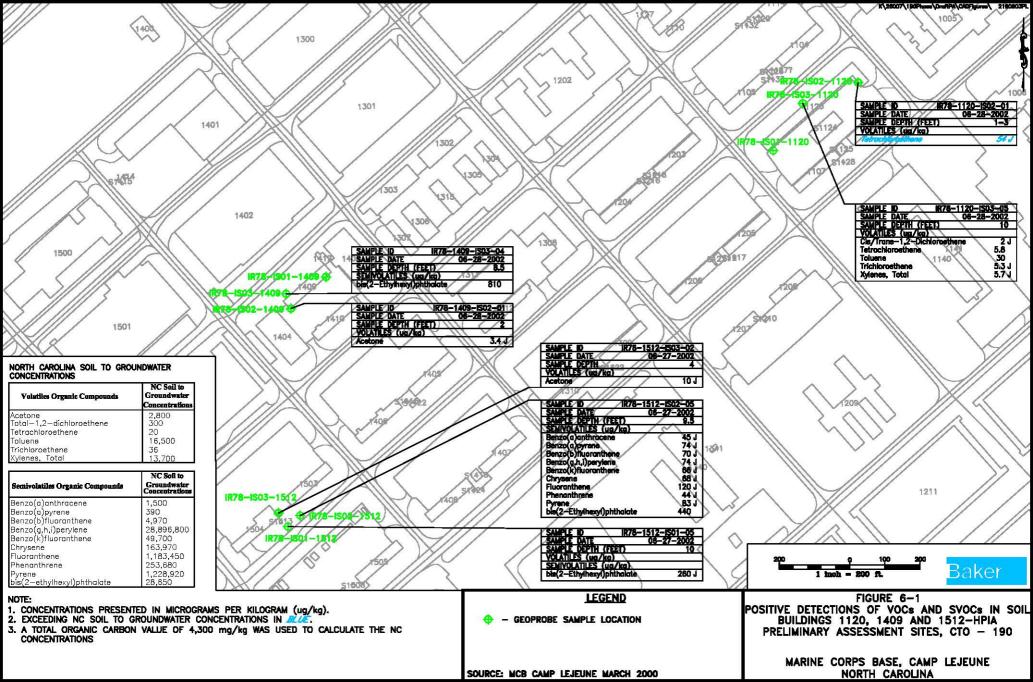
of public water systems (U.S. Environmental Protection Agency - Drinking Water Regulations and Health Advisories).

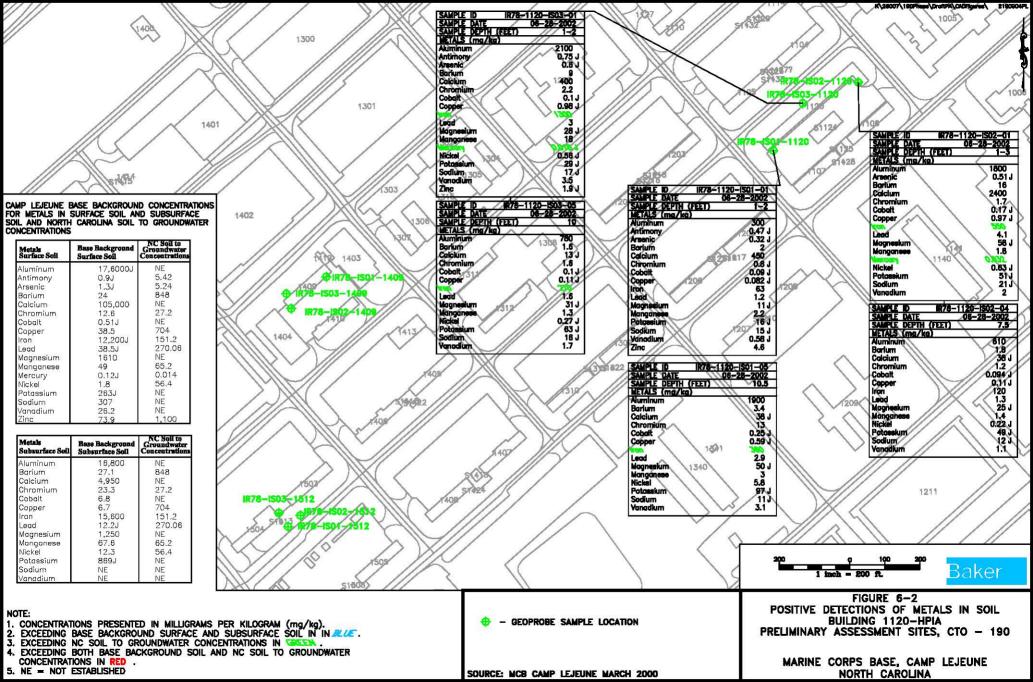
NCWQS = North Carolina Water Quality Standards (North Carolina Administrative Code, Title 15A, Subchapter 2L).

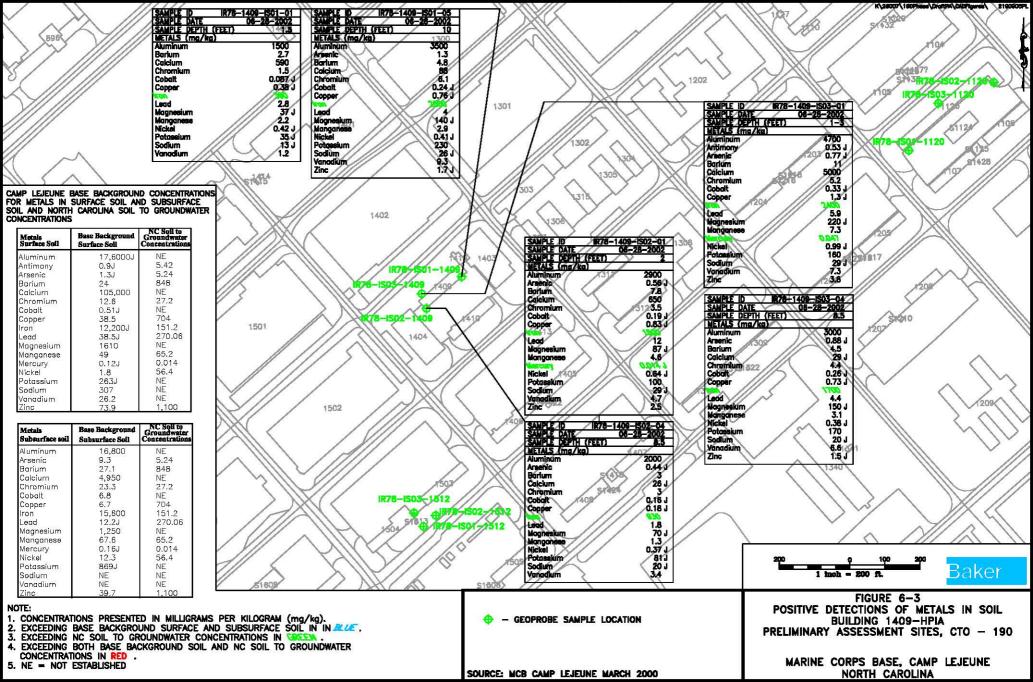
(*) = NCWQS for BHC

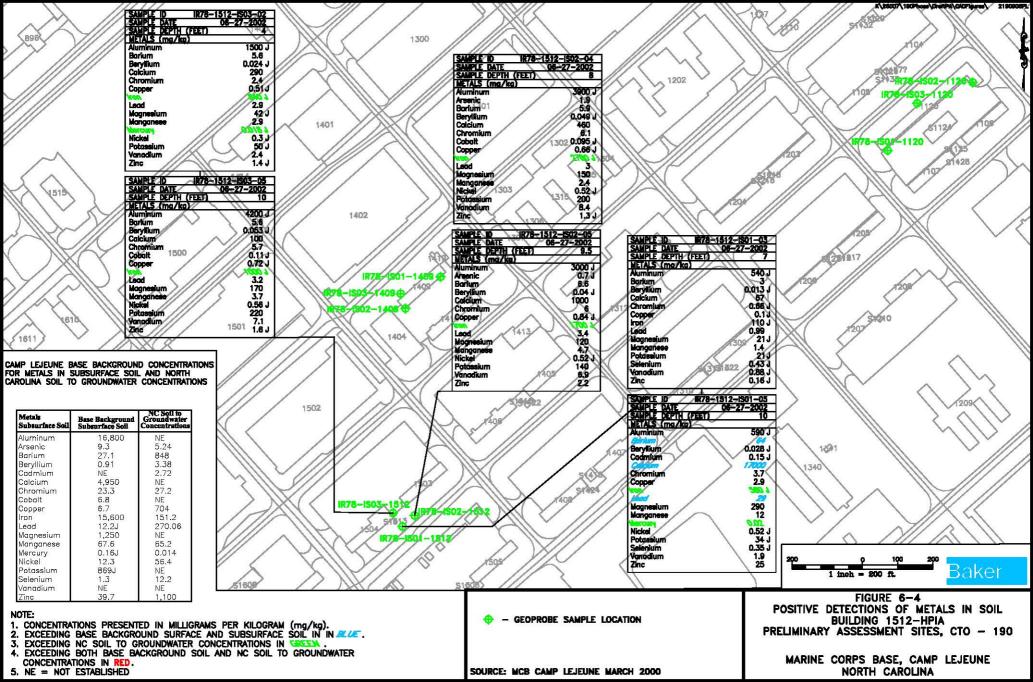
Base = shallow groundwater data from Base Background Study for Metals in Groundwater at Camp Lejeune (Baker, September 2002).

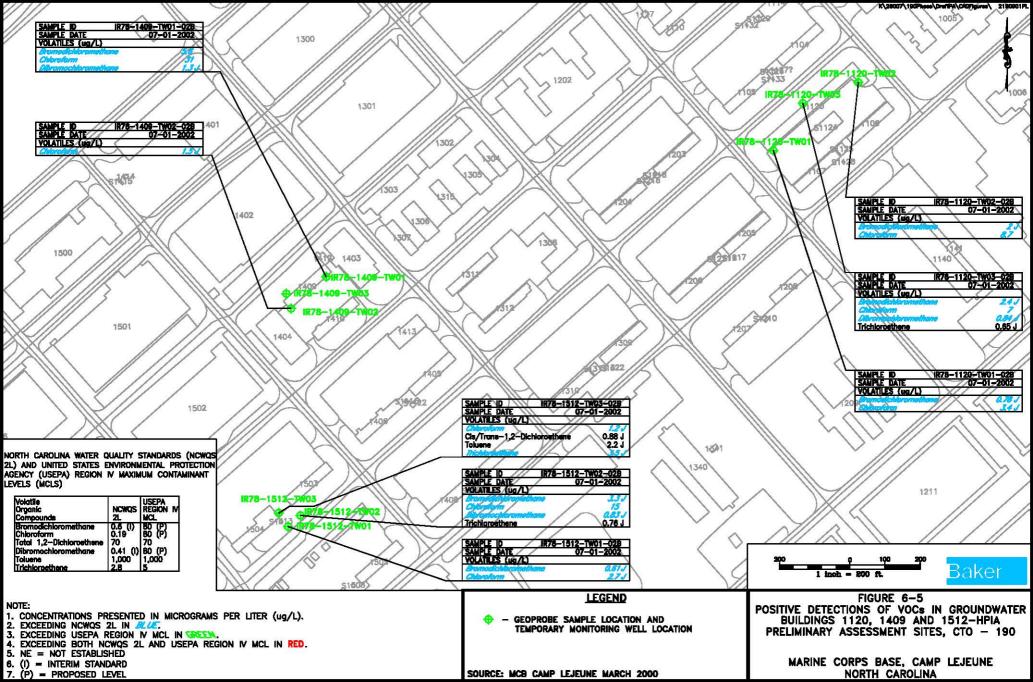
Background

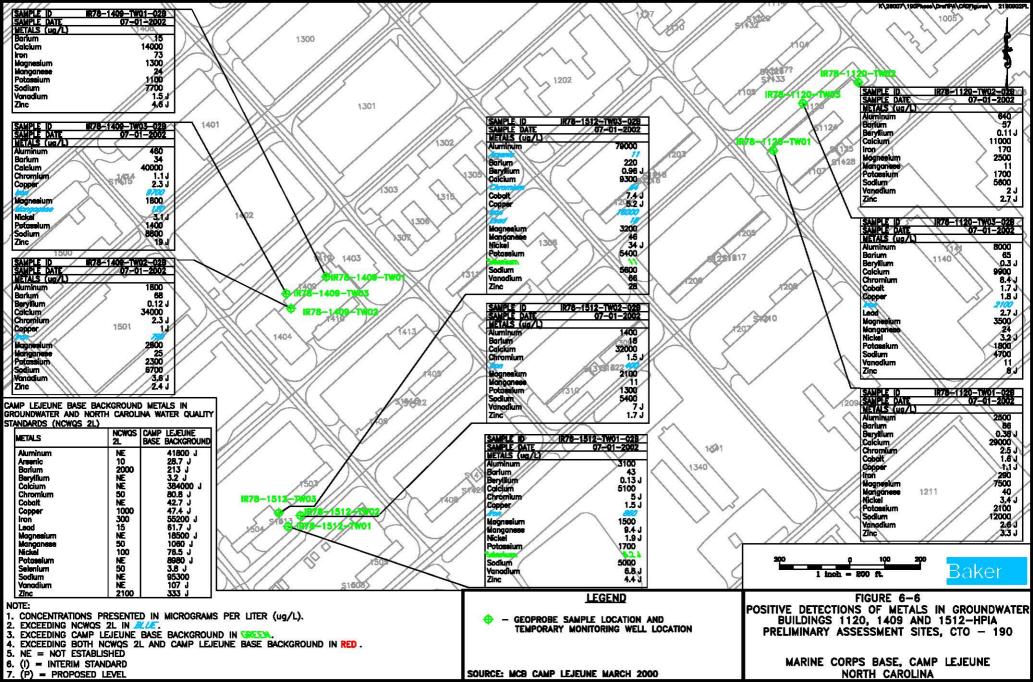


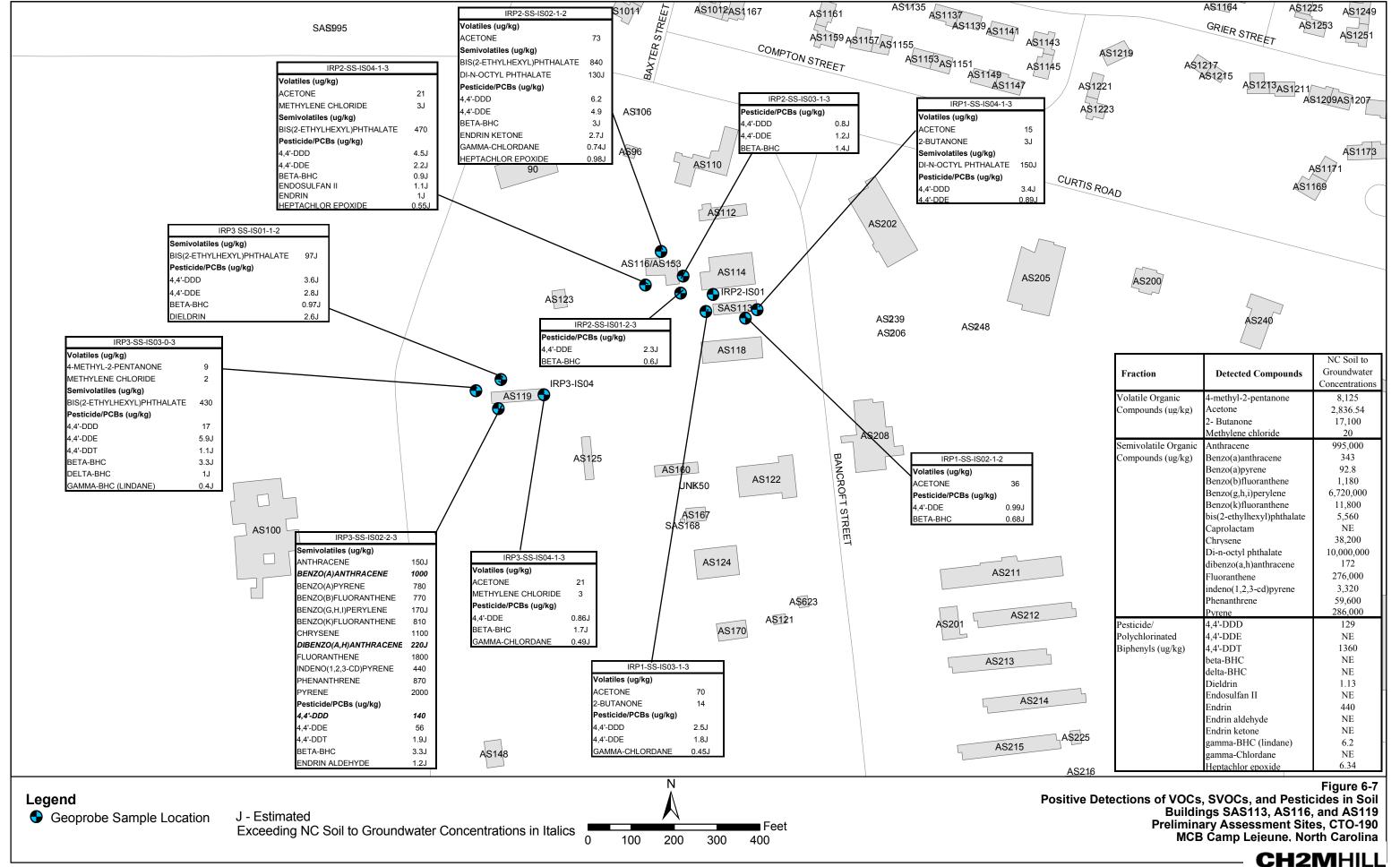


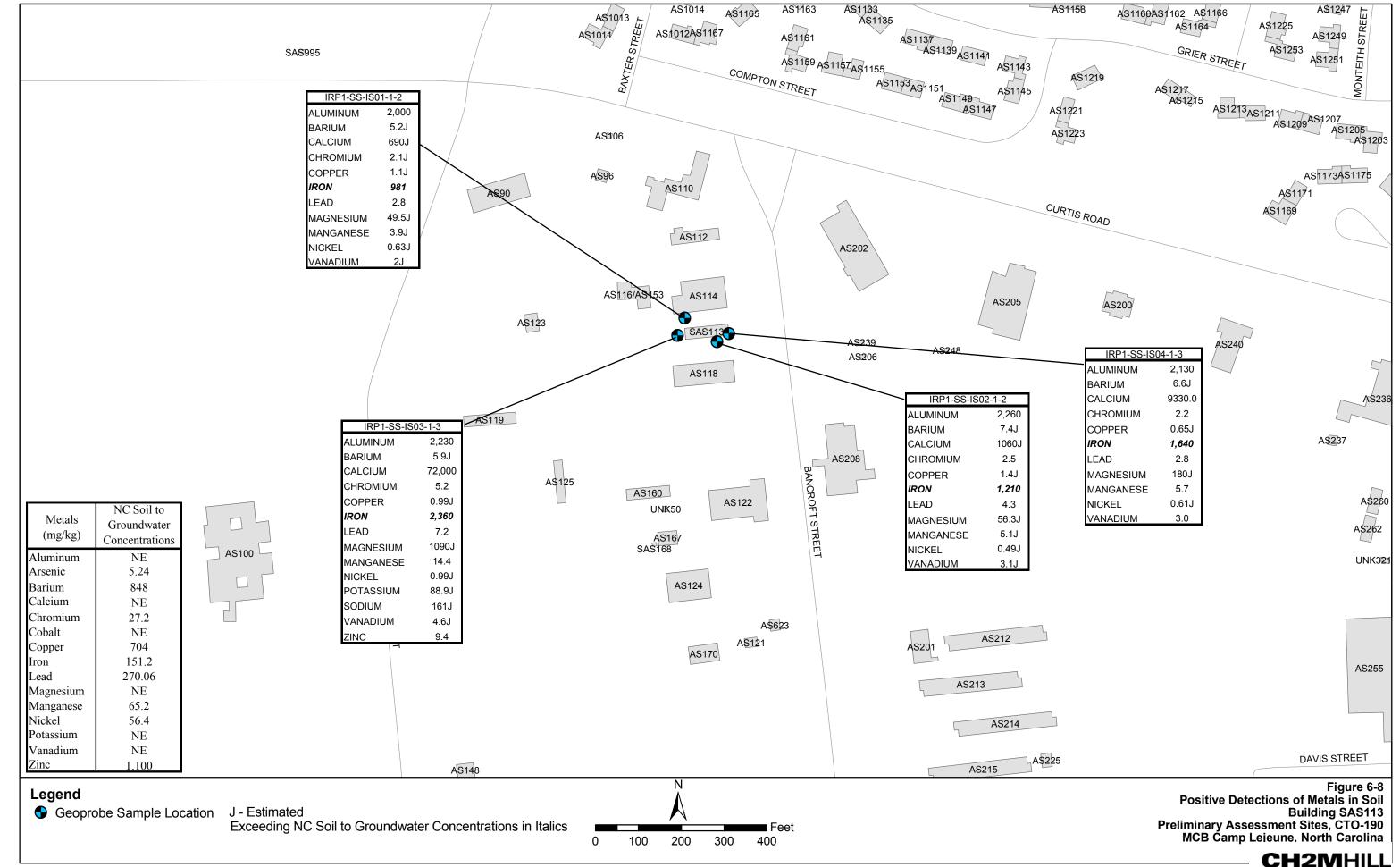


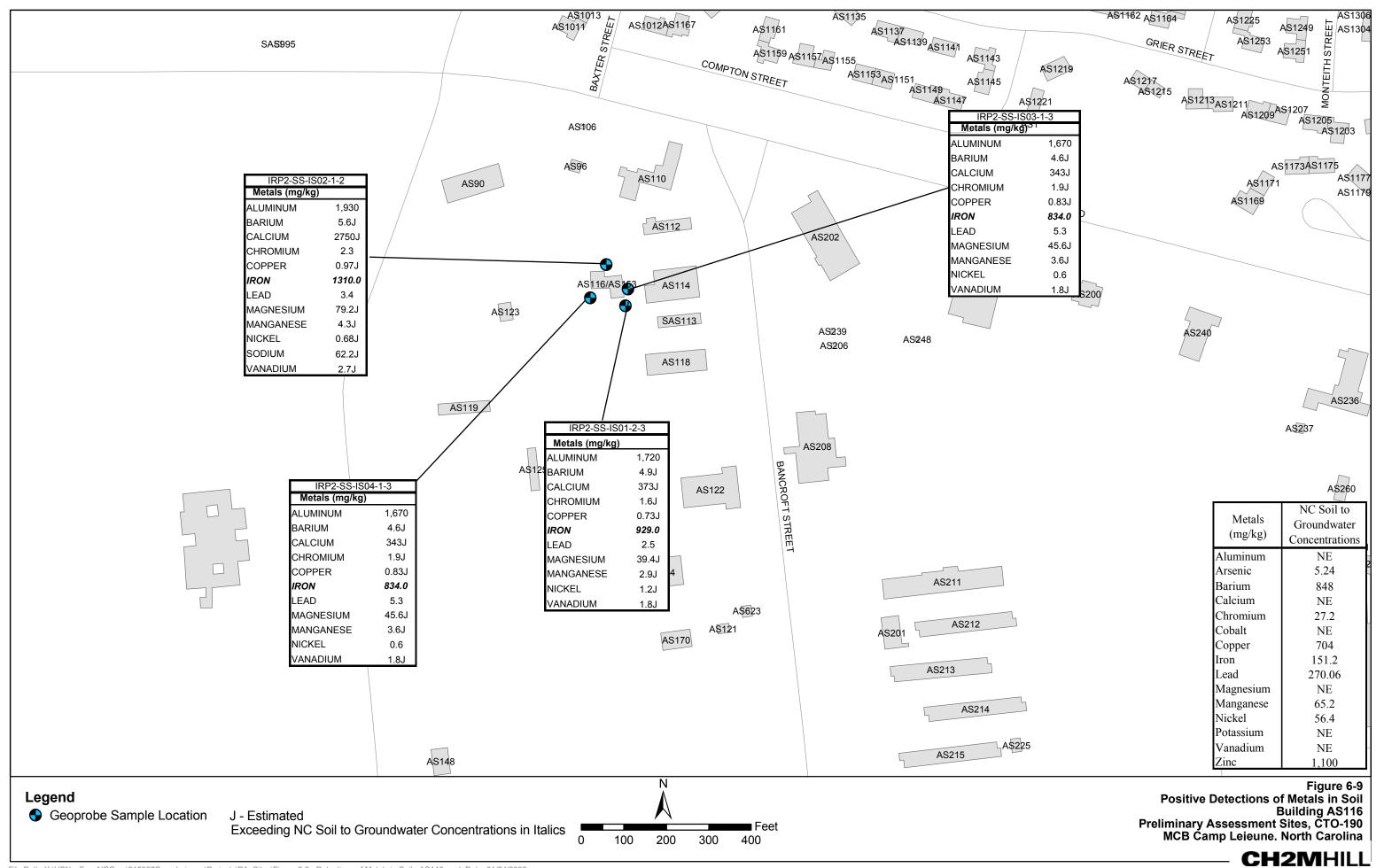


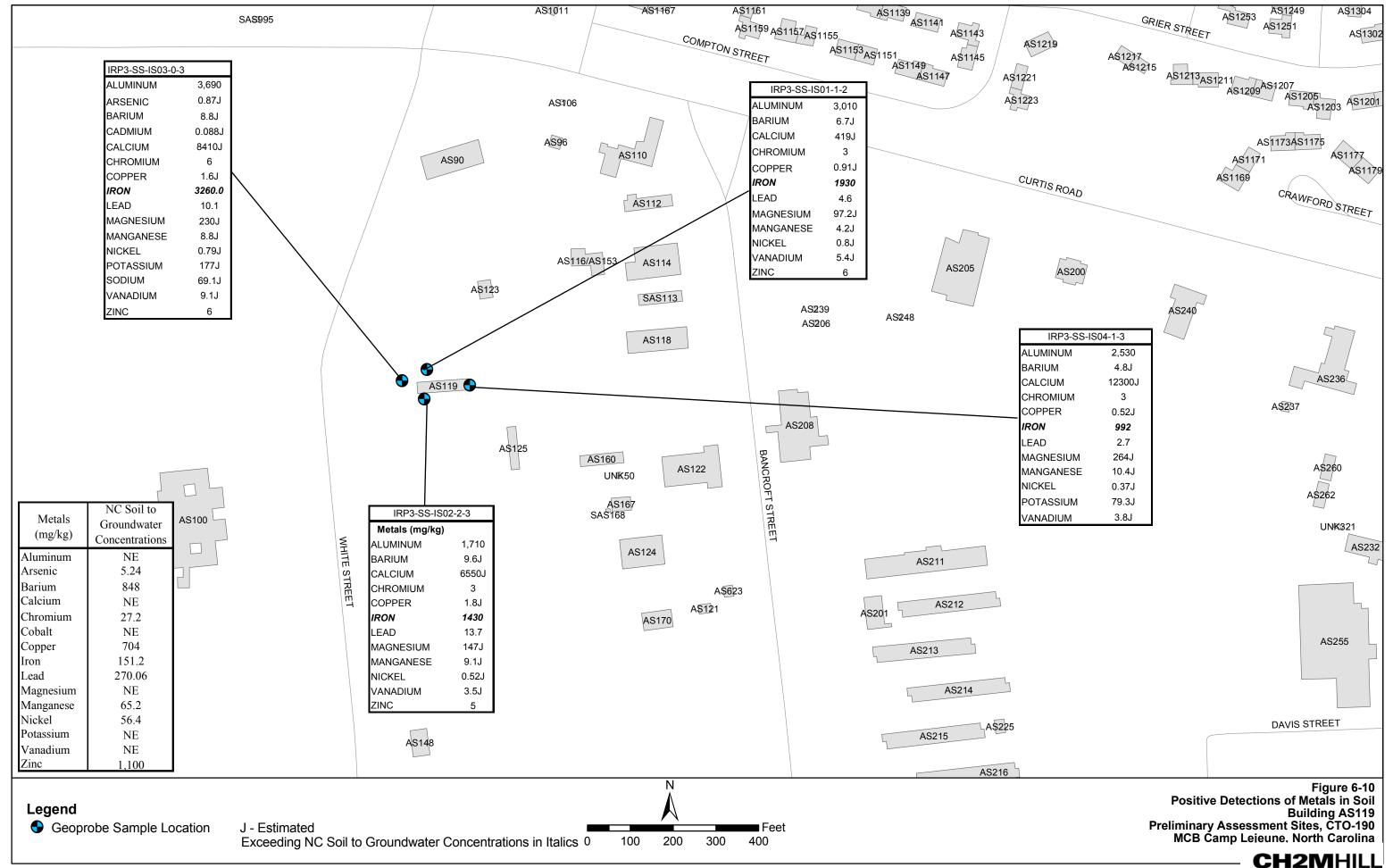


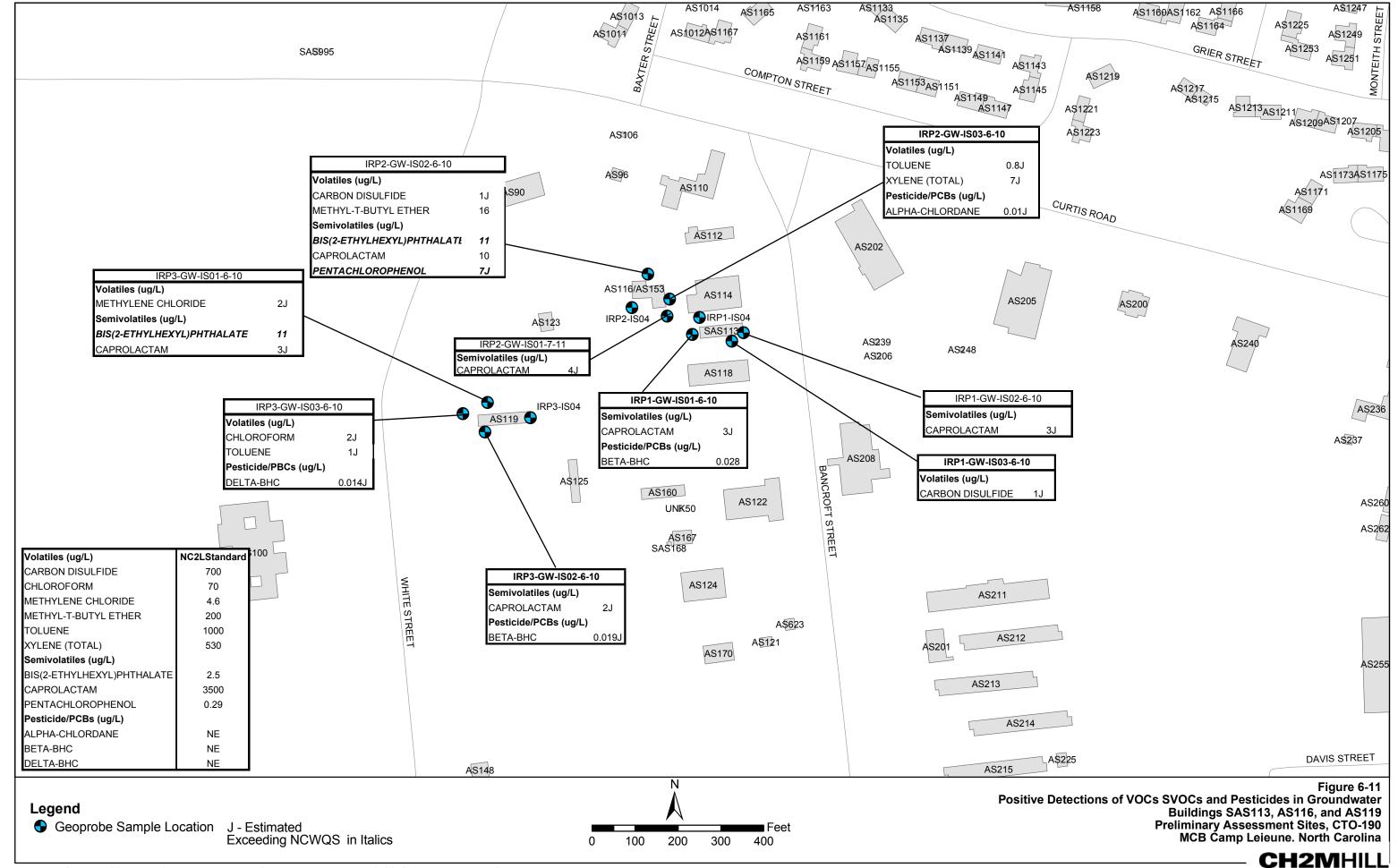


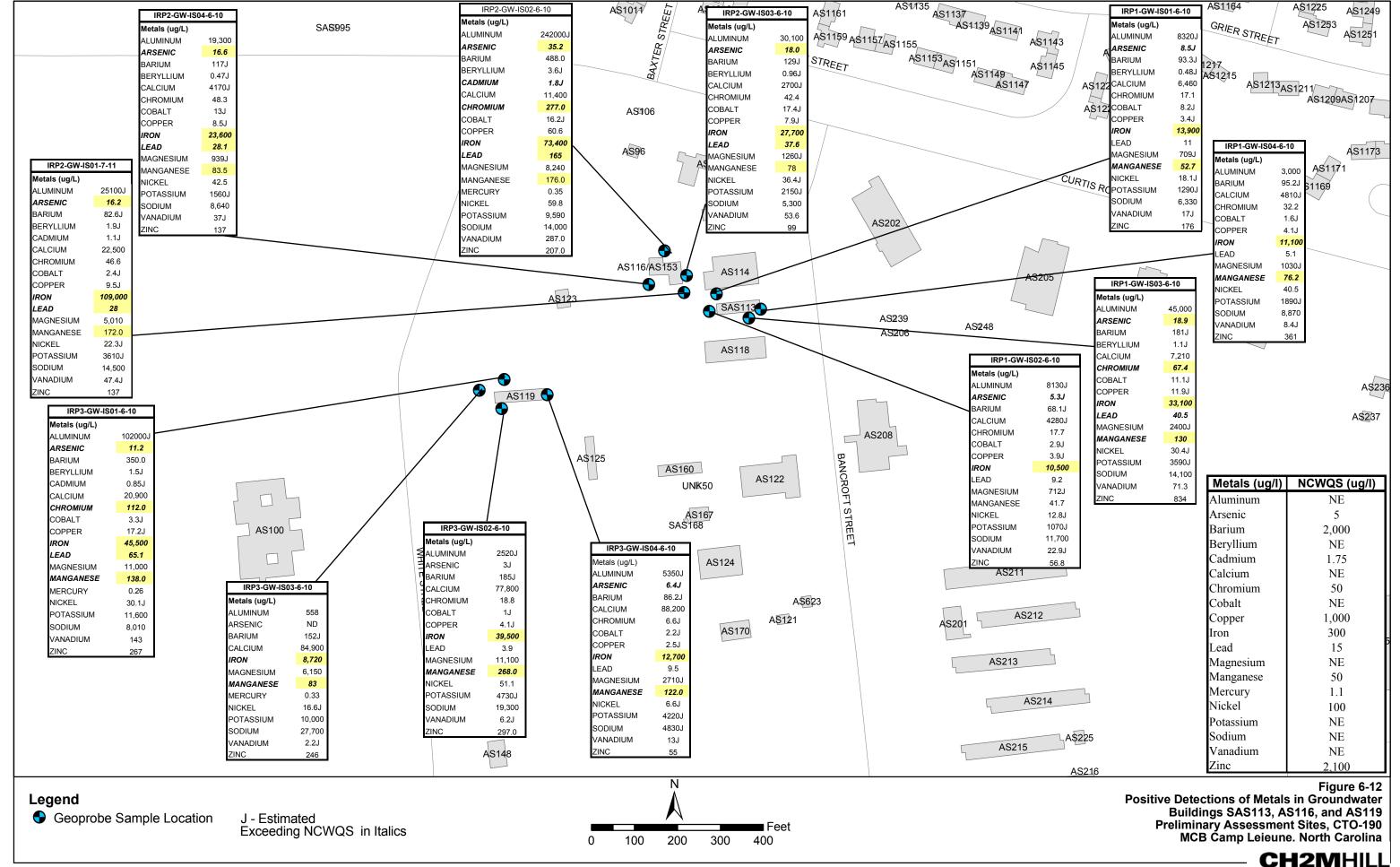


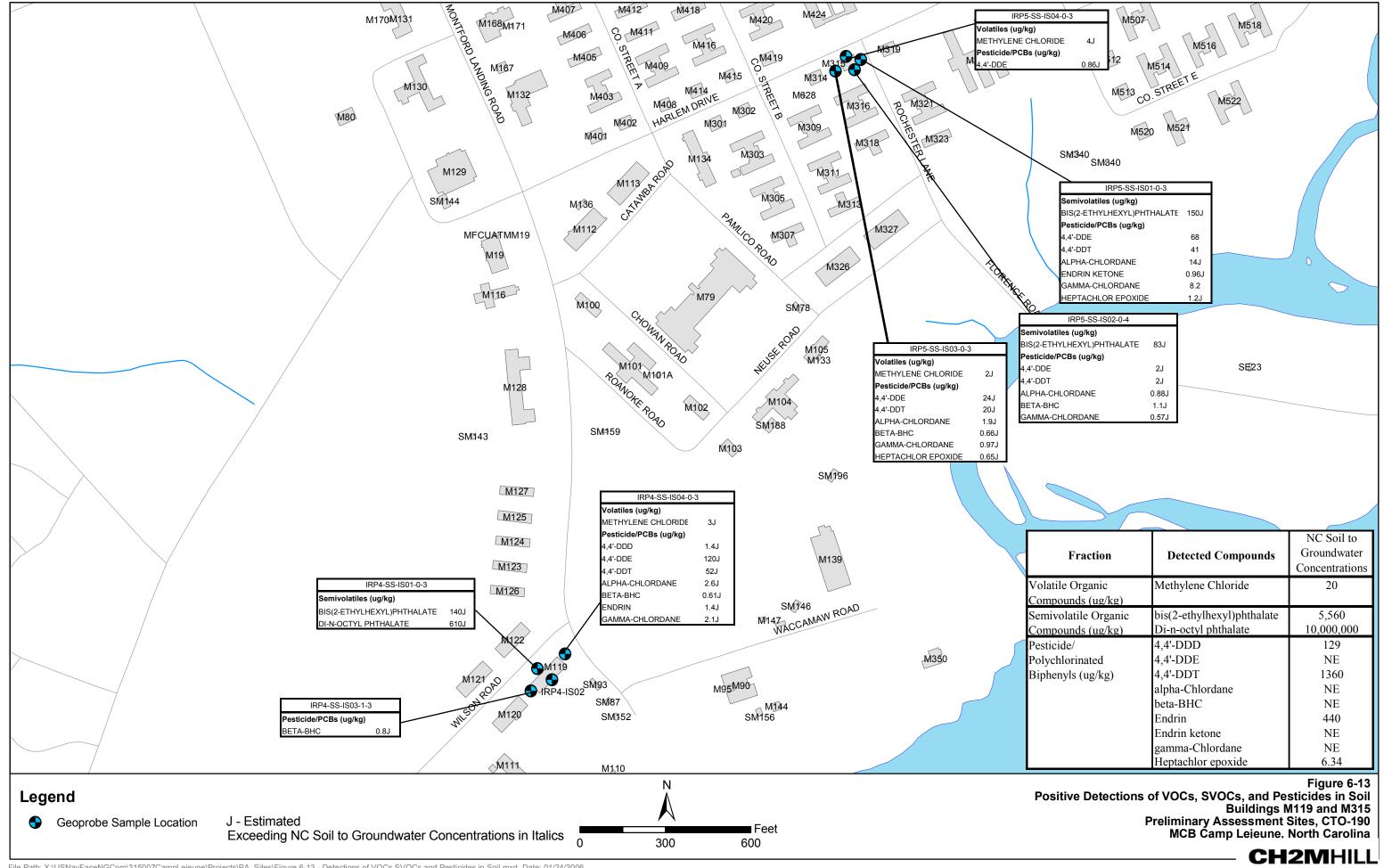


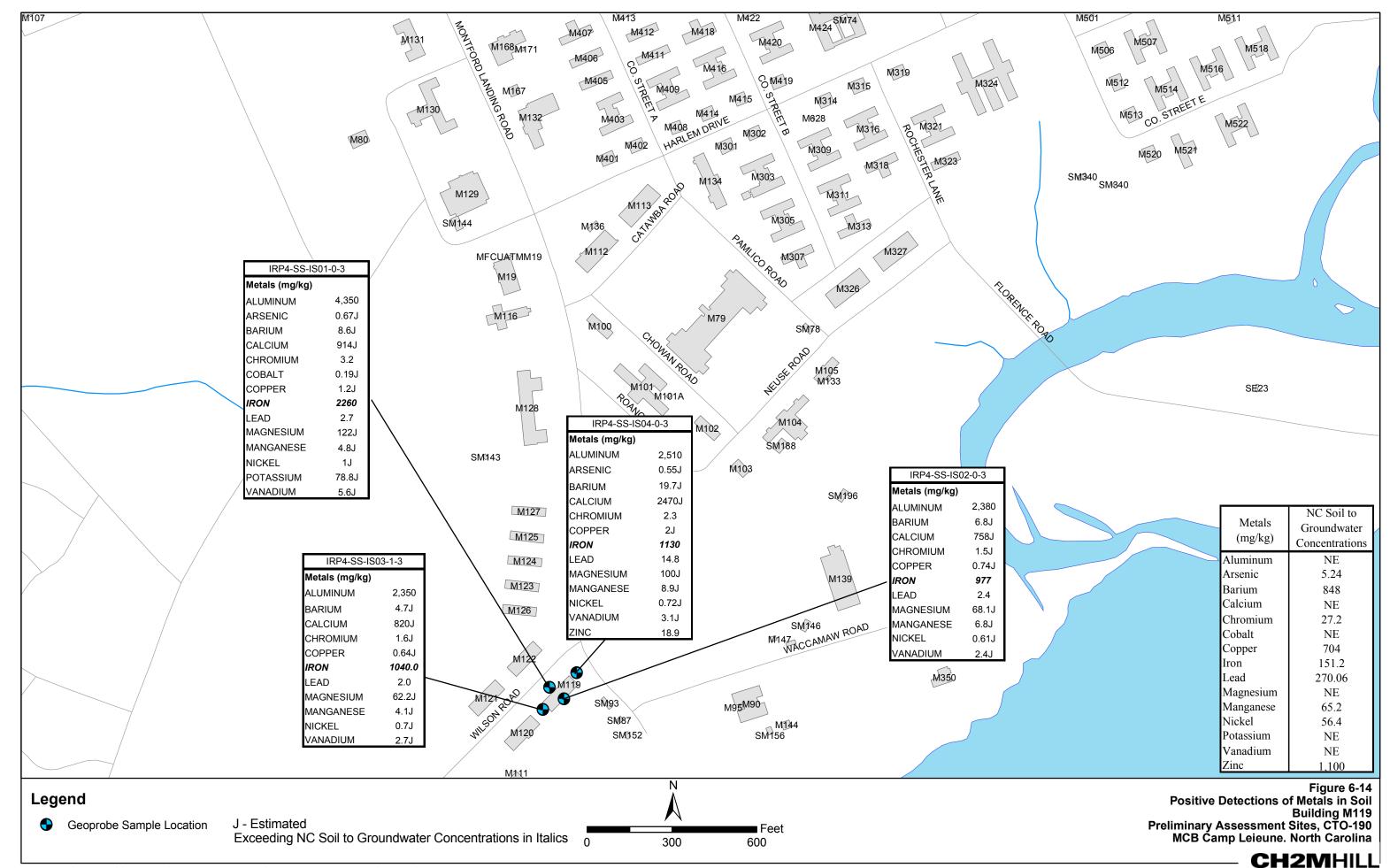


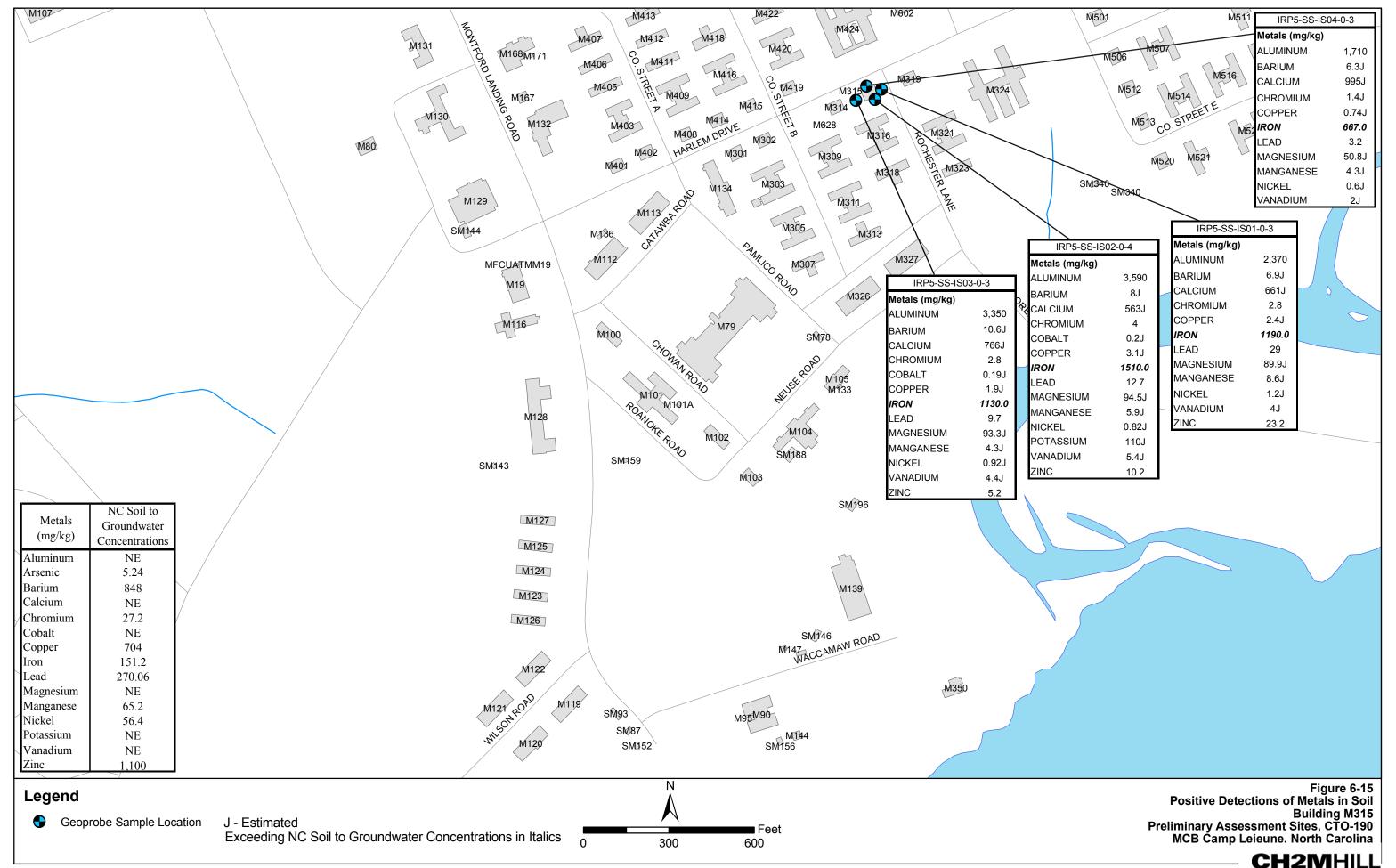


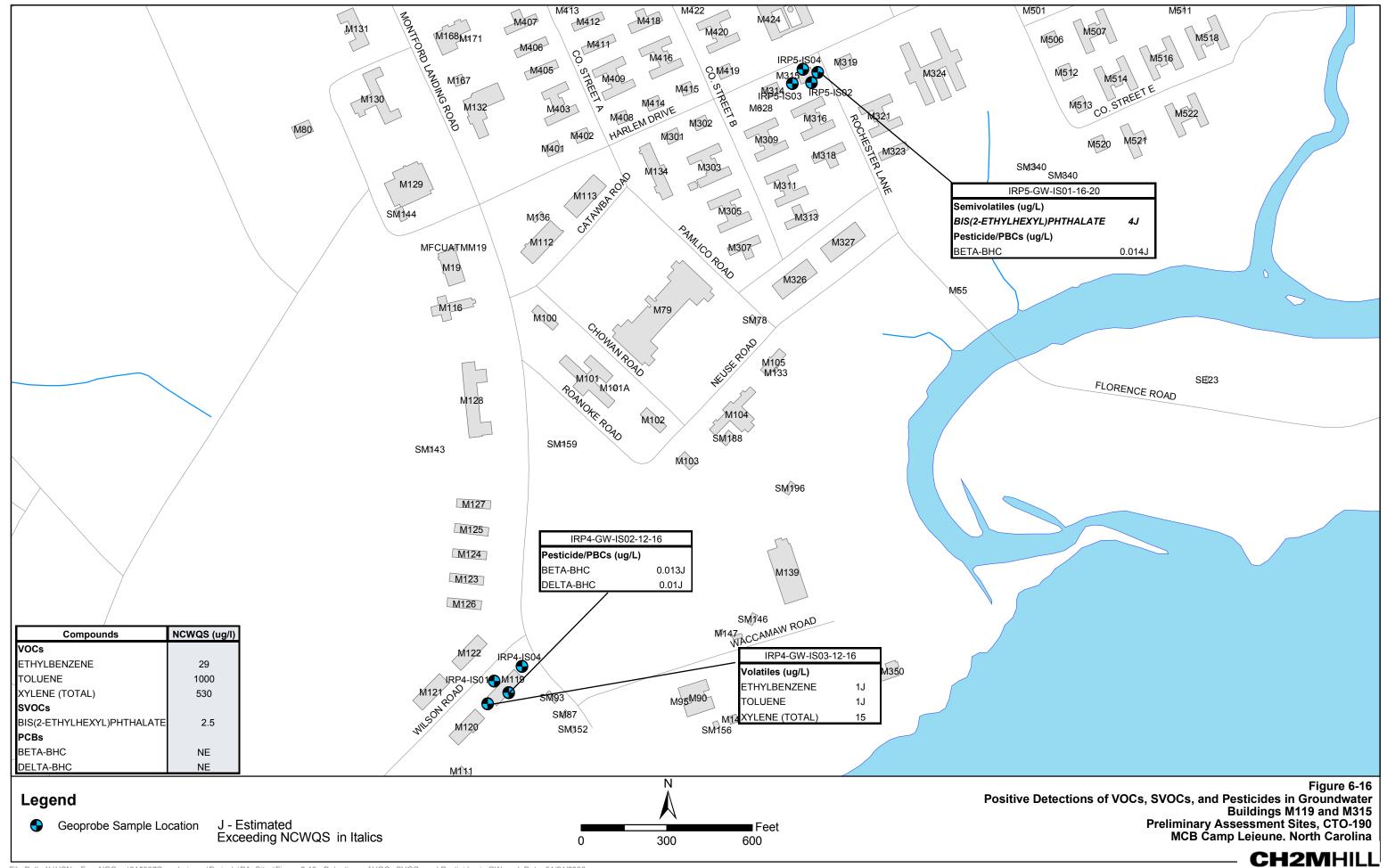


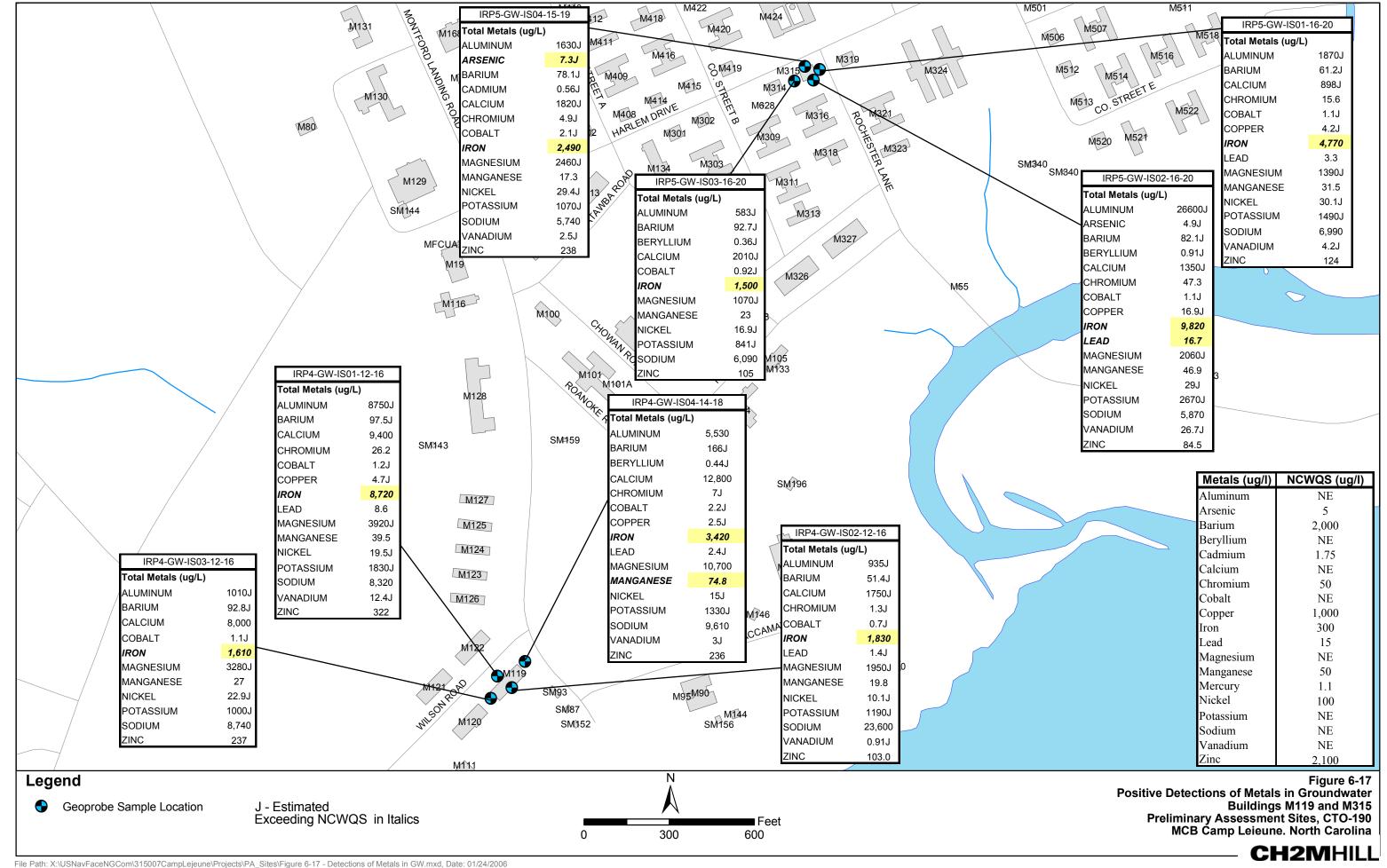












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 - F.7 Building HP908, Soil Gas Investigation (Baker, June 1994)
 - F.8 Building HP908, Monitoring Well Installation (Baker, June 1994)
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 - F.11 Buildings HP1409 and HP1512, Soil Borings at Neighboring Buildings HP1502, HP1601, and HP1602 (ESE, April 1992)
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- I Preliminary Assessment Field Investigation Checklists (Field Reconnaissance)
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APPENDIX A
ELEMENTS OF THE PRELIMINARY
ASSESSMENT AND SITE INSPECTION

Elements of the Preliminary Assessment Step

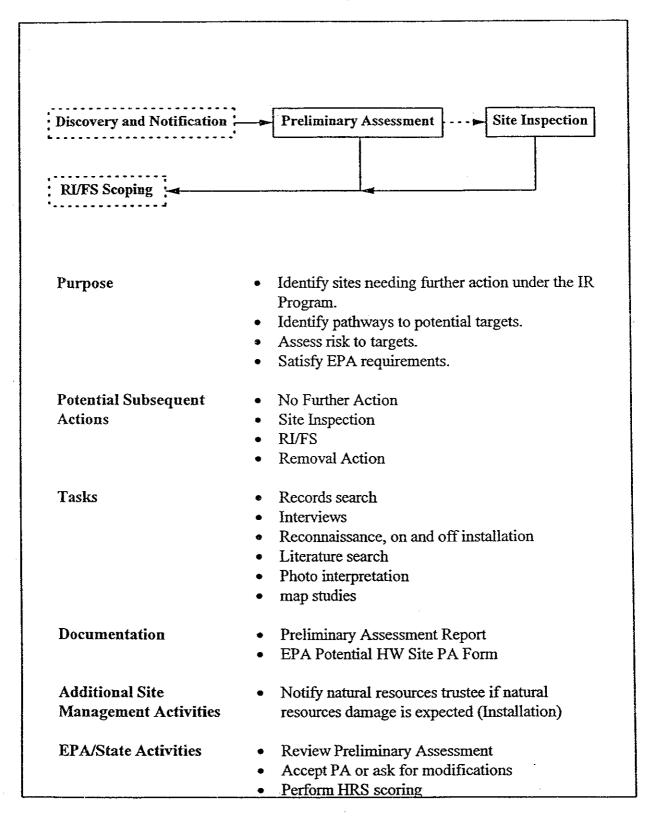


Figure 4-2: Elements of the Preliminary Assessment Step

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Elements of the Site Inspection Step

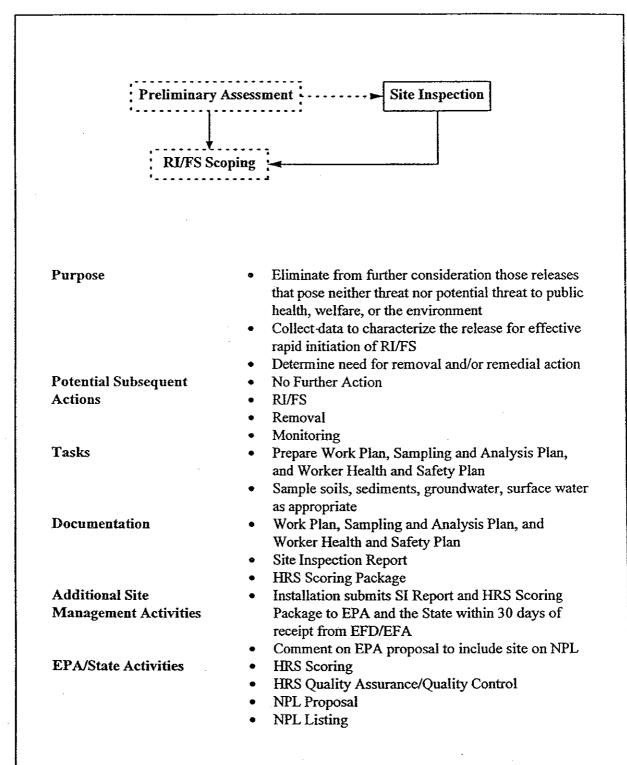
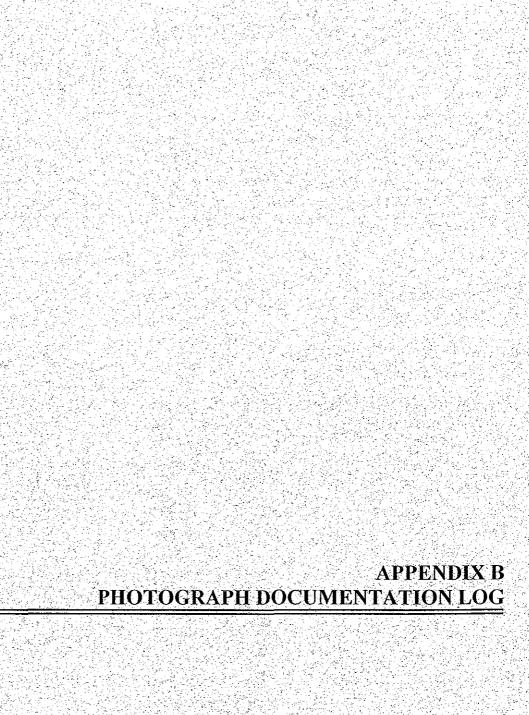


Figure 4-3: Elements of the Site Inspection Step



APPENDIX B

PHOTO DOCUMENTATION LOG

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4	HP902	East	B-2
5	HP902	West	B-3
6	HP902	West	B-3
7	HP902	West	B-4
8	HP908	West	B-4
9	HP908	West	B-5
10	HP908	West	B-5
11	HP908	South	B-6
12	HP908	East	B-6
13	HP1120	North	B-7
14	HP1120	West	B-7
15	HP1120	West	B-8
16	HP1120	South	B-8
17	HP1120	East	B-9
18	HP1124	North	B-9
19	HP1124	West	B-10
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22	HP1124	Hazardous waste storage	B-11
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26	HP1409	North-West	B-13
27	HP1512	North	B-14
28	HP1512	South-West	B-14
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30	TC830	South	B-15
31	TC830	South	B-16
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47	AS119	South-West	B-24
48	AS119	South	B-24
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53	M119	East	B-27
54	SM173	West	B-27
55	SM173	South-West	B-28



PHOTO 1: BUILDING HP902 LOOKING SOUTH, WASH PAD AND DRUMS STORAGE



PHOTO 2: BUILDING HP902 LOOKING SOUTH, HEAVY EQUIPMENT STORAGE



PHOTO 3: BUILDING HP902 LOOKING EAST, WEST SIDE OF BUILDING



PHOTO 4: BUILDING HP902 LOOKING EAST, NORTH SIDE OF BUILDING



PHOTO 5: BUILDING HP902 LOOKING WEST, EAST SIDE OF BUILDING



PHOTO 6: BUILDING HP902 LOOKING WEST, STORAGE AREA BEHIND BUILDING



PHOTO 7: BUILDING HP902 LOOKING WEST, SOUTH SIDE OF BUILDING



PHOTO 8: BUILDING HP908 LOOKING WEST, SOUTH SIDE OF BUILDING, SHOWING RAISED STRUCTURES



PHOTO 9: BUILDING HP908 LOOKING WEST, EAST SIDE OF BUILDING



PHOTO 10: BUILDING HP908 LOOKING WEST, NORTH SIDE OF BUILDING



PHOTO 11: BUILDING HP908 LOOKING SOUTH, NORTH SIDE OF BUILDING, SHOWING PAINT LOCKER



PHOTO 12: BUILDING HP908 LOOKING EAST, WEST SIDE OF BUILDING, SHOWING PAINT LOCKER ON LEFT



PHOTO 13: BUILDING HP1120 LOOKING NORTH, SOUTH SIDE OF BUILDING



PHOTO 14: BUILDING HP1120 LOOKING WEST, EAST SIDE OF BUILDING



PHOTO 15: BUILDING HP1120 LOOKING WEST, NORTH-EAST SIDE OF BUILDING



PHOTO 16: BUILDING HP1120 LOOKING SOUTH, NORTH SIDE OF BUILDING



PHOTO 17: BUILDING HP1120 LOOKING EAST, WEST SIDE OF BUILDING



PHOTO 18: BUILDING HP1124 LOOKING NORTH, SOUTH SIDE OF BUILDING, SHOWING BUILDING HP1120 ON LEFT



PHOTO 19: BUILDING HP1124 LOOKING WEST, EAST SIDE OF BUILIDNG



PHOTO 20: BUILDING HP1124 LOOKING SOUTH, NORTH SIDE OF BUILDING



PHOTO 21: BUILDING HP1124 LOOKING EAST, WEST SIDE OF BUILDING



PHOTO 22: BUILDING HP1124 HAZARDOUS WASTE STORAGE



PHOTO 23: BUILDING HP1124 PAINT SPRAY BOOTH INSIDE BUILDING



PHOTO 24: BUILDING HP1409 LOOKING EAST, WEST SIDE OF BUILDING



PHOTO 25: BUILDING HP1409 LOOKING WEST, EAST SIDE OF BUILDING



PHOTO 26: BUILDING HP1409 LOOKING NORTH-WEST, AST STORAGE ADJACENT TO BUILDING



PHOTO 27: FORMER BUILDING HP1512 AREA LOOKING NORTH - WEST, DRUMS AND TIRES STORAGE AREA ON WASHPAD



PHOTO 28: FORMER BUILDING HP1512 AREA LOOKING SOUTH-WEST, DRUMS STORED ON WASH PAD



PHOTO 29: BUILDING TC830 LOOKING SOUTH, EAST SIDE OF BUILDING



PHOTO 30: BUILDING TC830 LOOKING SOUTH, NORTH SIDE OF BUILDING



PHOTO 31: BUILDING TC830 LOOKING SOUTH, WEST SIDE OF BUILDING



PHOTO 32: BUILDING TC830 LOOKING NORTH, SOUTH SIDE OF BUILDING



PHOTO 33: BUILDING SAS113 LOOKING SOUTH-WEST, EAST SIDE OF BUILDING



PHOTO 34: BUILDING SAS113 LOOKING WEST, NORTH SIDE OF BUILDING, 4 LARGE OPEN BAYS



PHOTO 35: BUILDING SAS113 LOOKING EAST, WEST SIDE OF BUILDING



PHOTO 36: BUILDING SAS113 LOOKING WEST, SOUTH SIDE OF BUILDING, SHOWING DEBRIS



PHOTO 37: BUILDING AS116 LOOKING WEST, EAST SIDE OF BUILDING, 4 BAY DOORS



PHOTO 38: BUILDING AS116 LOOKING NORTH-EAST, SOUTH SIDE OF BUILDING



PHOTO 39: BUILDING AS116 LOOKING EAST, WEST SIDE OF BUILDING, OPEN STORAGE AREA



PHOTO 40: BUILDING AS116 LOOKING EAST, DRUMS AND EQUIPMENT STORAGE AREA



PHOTO 41: BUILDING AS116 LOOKING SOUTH-WEST, NORTH SIDE OF BUILDING, OPEN STORAGE AREA ON RIGHT

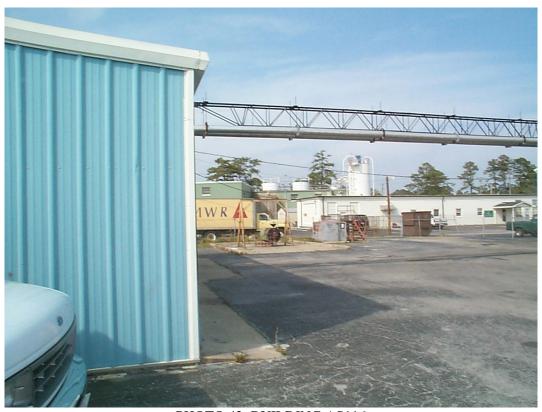


PHOTO 42: BUILDING AS116 LOOKING NORTH, SWMU 299 (ASTs) SHOWN IN BACKGROUND



PHOTO 43: BUILDING AS119 LOOKING NORTH-EAST, SOUTH SIDE OF BUILDING, FUEL OIL AST SHOWN



PHOTO 44: BUILDING AS119 LOOKING NORTH, WEST SIDE OF BUILDING, WASH RACK SHOWN



PHOTO 45: BUILDING AS119 LOOKING NORTH, WASH RACK AND DRAINAGE SHOWN



PHOTO 46: BUILDING AS119 LOOKING NORTH-WEST, EAST SIDE OF BUILDING



PHOTO 47: BUILDING AS119 LOOKING SOUTH-WEST, NORTH SIDE OF BUILDING, 3 OPEN BAYS



PHOTO 48: BUILIDNG AS119 LOOKING SOUTH, NORTH SIDE OF BUILDING, 3 OPEN STORAGE BAYS



PHOTO 49: BUILDING AS119 LOOKING EAST, TRASH DUMPSTERS IN LOT



PHOTO 50: BUILDING M119 LOOKING NORTH-EAST, SOUTH SIDE OF BUILDING, 4 BAYS



PHOTO 51: BUILDING M119 LOOKING NORTH-EAST, WEST SIDE OF BUILDING, DIESEL AST ON WASH PAD SHOWN



PHOTO 52: BUILDING M119 LOOKING SOUTH-WEST, NORTH SIDE OF BUILDING, OFFICE AREA



PHOTO 53: BUILDING M119 LOOKING WEST, EAST SIDE OF BUILDING, 3 BAYS



PHOTO 54: FORMER BUILDING SM173 AREA LOOKING WEST, WASH RACK SHOWN



PHOTO 55: FORMER BUILDING SM173 AREA LOOKING SOUTH-WEST, WASH RACK SHOWN

APPENDIX C NON-CERCLA AREAS / UST PROGRAM INFORMATION

APPENDIX C

NON-CERCLA AREAS OF CONCERN UST AND AST FINDINGS FROM THE PA REPORT

During the site visit and Environmental Literature Review, UST Program areas and ASTs potentially containing oil were located which are classified as CERCLA petroleum exclusions. These non-CERCLA areas of concern are discussed in this appendix. Although these non-CERCLA areas of concern are not evaluated under CERCLA as hazardous materials, they are regulated as pollutants under RCRA. The following discusses the non-CERCLA areas of concern in detail.

Building HP902

AST

An AST and drums were identified inside a fenced storage area during the site visit, as shown in Appendix B, Photo 1. The capacity of the AST is approximately 250 gallons and contains used oil. The drums are approximately 55 gallons each and contain used oil. Other storage containers that were identified include containers of a capacity of 17.55 gallons, containing oil, and were described as being in excellent condition. No evidence of release was identified for any of the storage containers.

Building HP1120

AST

One AST was found during the Environmental Literature Review and described as being installed pre 1972, having a capacity of 1,000 gallons, and to contain waste oil. Records indicate that this AST was pumped out by Base maintenance. It is recommended that the AST in Building HP1120 require further investigations to determine if contamination exists.

Building HP1409

AST

During the site visit several ASTs were identified adjacent to Building HP1409 as show in Appendix B, Photo 26. As shown, there is a small shed with fencing surrounding the area that stores ASTs. The contents and capacity of the ASTs and containers are unknown; however, they appear to be rusting as shown on Photo 26. It is recommended that the ASTs in this area of Building HP1409 require further investigation to determine if contamination exists.

Building AS119

AST

During work performed in 1988, a number of structures were removed from Building AS119, or updated as shown in Appendix E, Figure AS119-1. An existing oil heater and associated piping and valves were replaced with a new fuel oil storage tank with a capacity of 250 gallons (Appendix E, Figure AS119-2). The new AST is surrounded by a concrete retainer wall as shown in Appendix E, Figure AS119-3. It is recommended that the area of the former oil tank and the current fuel oil tank require further investigation to determine potential contamination.

Building M119

UST

The Environmental Literature Review discovered that in 1989 records show and estimate 2,045 gallons of waste oil from Buildings M119 and M120 were deposited into an UST. The status and location of this UST is unknown. This UST should be verified with the UST program to identify the status of the tank and if contamination exists.

ASTs

The ASTs that contain fuel oil for heating Building M119 should be investigated to determine the condition they are in and if any potential leaks may have occurred. ASTs have also been removed and replaced at this building and the area of these former ASTs should also be

investigated. In addition to the fuel oil AST, a diesel AST was identified on the west side of the building as shown in Appendix B, Photo 51. The capacity of the tank is 500 gallons, and appears to be new.

UST Program Status Twenty New Sites of Potential Concern MCB, Camp Lejeune, North Carolina CTO - 0190

BB-71:

There is 1 former UST Program Site (BB-71) and 1 UST Program Site (BB-51) which was transferred to the IR Program in the vicinity of building BB-71. Former UST Site BB-71 was a 500 Gal. Used Waste Oil tank where a Phase I LSA was performed in 10/99 and No further Action status was granted on 7/28/00. UST Site BB-51, a 300 Gal. Waste Oil tank, was transferred to the IR Program on 8/9/95. There are 18 monitoring Wells associated with this site.

BB-16:

There is 1 Active UST Program Site (BB-293) and 1 UST Program Site (BB-9) which was transferred to the IR Program in the vicinity of building BB-16. UST Site BB-293 was a 550 Gal. Used Waste Oil tank where a Comprehensive Site Assessment (CSA) was performed in 12/98 and No further Action status has been requested for this site. There are 6 monitoring Wells associated with this site. UST Site BB-9, a 10,000 Gal. Diesel tank, was transferred to the IR Program on 8/9/95. There are 19 monitoring Wells associated with this site.

902:

There are 3 former UST Program Sites (903(901), 738, S-947(913)) and 1 Active UST Program Site (900) in the vicinity of building 902. Former UST Site 738 was a 1000 Gal. Diesel tank where a No further Action status was granted on 3/25/99. Former UST Site S-947(913) was a 550 Gal. Waste Oil tank where a No further Action status was granted on 7/26/96. Former UST Site 903(901) was a 550 Gal. Kerosene tank where a Three Well Site Check was performed in 8/93 and a sampling report filed for 10/97. A No further Action status has been granted for this site on 11/9/96. The monitoring Wells associated with this site have been scheduled for abandonment on 7/17/01. UST Site 900, a 5000 Gal. Diesel tank where a Site Check was performed in 2/96 and a CSA was performed in 8/97. There are 10 monitoring Wells associated with this site.

908:

There is 1 former UST Program Site (S-947(913)) in the vicinity of building 908. Former UST Site S-947(913) was a 550 Gal. Waste Oil tank where a No further Action status was granted on 7/26/96.

1120:

There are 2 former UST Program Sites (1106, 1205/S-1213) and 1 Active UST Program Site (HPFF/1115) in the vicinity of building 1120. Former UST Site 1205/S-1213 was a 500 Gal. Used Oil tank where a No further Action status was granted on 6/28/01. Former UST Site 1106 was a 550 Gal. Waste Oil tank where a CSA was performed in 1997 and is currently being assessed by NCDENR for No further Action status. North of building 1120 is one of the UST Programs largest Sites. HPFF/1115 is a former Fuel Tank Farm which has both Soil and Groundwater POL contamination. There have been numerous assessments done in the area and the site has an active AS/SVE system in place and an extensive monitoring well field in the old tank farm area.

S-1124:

Same as 1120

1409:

There are 2 former UST Program Sites (1401, 1502-1) and 1 Active UST Program Site (1502-2) in the vicinity of building 1409. Former UST Site 1401 was a 3000 Gal. Diesel tank where a No further Action status was granted on 3/17/99. Former UST Site 1502-1 was a 550 Gal. Waste Oil tank where a Three Well Site Check was performed in 10/95 and a No further Action status was granted on 4/6/99. The monitoring Wells associated with this site have been scheduled for abandonment on 7/17/01. A Limited Site Assessment has been requested for UST Site 1502-2, a 560 Gal. Gasoline tank, on 7/17/01.

1500:

There are 2 former UST Program Sites (1401, 1502-1) and 3 Active UST Program Sites (1502-2, 1613, 1612) in the vicinity of building 1500. Former UST Site 1401 was a 3000 Gal. Diesel tank where a No further Action status was granted on 3/17/99. Former UST Site 1502-1 was a 550 Gal. Waste Oil tank where a Three Well Site Check was performed in 10/95 and a No further Action status was granted on 4/6/99. The monitoring Wells associated with this site have been scheduled for abandonment on 7/17/01. A Limited Site Assessment has been requested for UST Site 1502-2, a 560 Gal. Gasoline tank, on 7/17/01. UST Site 1613, a 10,000 Gal. Gasoline tank, where a CSA was performed in 5/96, has an active AS/SVE system in place and has an extensive monitoring well field associated with it. A Limited Site Assessment has been requested for UST Site 1612, where hydraulic lifts were excavated, on 7/17/01.

1502:

There are 2 former UST Program Sites (1607, 1502-1), 1 Active UST Program Site (1502-2) and 1 UST Program Site (1601) which was transferred to the IR Program in the vicinity of building 1502. Former UST Site 1607 was a 500 Gal. Used Oil tank where a No further Action status was granted on 2/1/99. Former UST Site 1502-1 was a 550 Gal. Waste Oil tank where a Three

Well Site Check was performed in 10/95 and a No further Action status was granted on 4/6/99. The monitoring Wells associated with this site have been scheduled for abandonment on 7/17/01. A Limited Site Assessment has been requested for UST Site 1502-2, a 560 Gal. Gasoline tank, on 7/17/01. UST Site 1601, a 1500 Gal. Used Oil tank, was transferred to the IR Program on 12/1/00. A CSA was performed in 12/97 but no permanent wells were installed.

S-1512:

There are 3 former UST Program Sites (1607, 1502-1, 1604/S-1616), 1 Active UST Program Site (1502-2) and 1 UST Program Site (1601) which was transferred to the IR Program in the vicinity of building S-1512. Former UST Site 1607 was a 500 Gal. Used Oil tank where a No further Action status was granted on 2/1/99. Former UST Site 1502-1 was a 550 Gal. Waste Oil tank where a Three Well Site Check was performed in 10/95 and a No further Action status was granted on 4/6/99. The monitoring Wells associated with this site have been scheduled for abandonment on 7/17/01. Former UST Site 1604/S-1616 was a 600 Gal. Used Oil tank where a No further Action status was granted on 6/28/01. A Limited Site Assessment has been requested for UST Site 1502-2, a 560 Gal. Gasoline tank, on 7/17/01. UST Site 1601, a 1500 Gal. Used Oil tank, was transferred to the IR Program on 12/1/00. A CSA was performed in 12/97 but no permanent wells were installed.

HP-438:

There is 1 former UST Program Site (331), 2 Active UST Program Sites (311, 333-B) and 1 UST Program Site (333-C) which was transferred to the IR Program in the vicinity of building HP-438. Former UST Site 331 was a 500 Gal. Heating Oil tank where a No further Action status was granted on 3/17/99. The monitoring Wells associated with this site have been scheduled for abandonment on 7/17/01. A Limited Site Assessment was performed for UST Site 311, a 551 Gal. Kerosene tank, on 12/21/00 and No further Action status has been requested for this site. There is 1 well associated with this site. A Limited Site Assessment has been requested for UST Site 333-B, a 500 Gal. Heating Oil tank, on 7/01. UST Site 333-C, a 550 Gal. Kerosene tank, was transferred to the IR Program on 6/21/01. A CSA was performed in 12/97 but no permanent wells were installed.

TT-2467:

There are 2 former UST Program Sites (TT-2455, TT-2453 Hyd Lift), and 4 Active UST Program Sites (TT-44, TT-2477-78, TT-2463-73, TT-2453) in the vicinity of building TT-2467. Former UST Site TT-2455 was a 1000 Gal. Heating Oil tank where a CSA was performed in 10/94 and a No further Action status was granted on 7/28/00. The monitoring Wells associated with this site have been abandoned. Former UST Site TT-2453 Hyd Lift was a site where hydraulic lifts were excavated and a No further Action status was granted on 6/14/01. A Limited Site Assessment has been requested for UST Site TT-44, a 1000 Gal. Heating Oil tank, on 7/17/01. A 3-well Site check was performed in 11/94 and there are 3 wells associated with this site. An extensive AS/SVE system and well field has been implemented to service an area to cover 2 of the Active UST Sites (TT-2477-78, TT-2453). A CSA was performed for UST Site TT-2477 in 4/95 while a CSA was performed on UST Site TT-2478 in 3/94. There was a

combination of Diesel, Gasoline and Used Oil Tanks totaling 42,050 Gal. of POL in the vicinity of the two buildings. UST Site TT-2453, a 550 Gal. Heating Oil tank had a 5 plus 3 well Site Check performed in 6/95. UST Site TT-2463-73 had a series of 500 Gal. Heating Oil tanks where a Comprehensive Site Assessment (CSA) was performed in 3/31/95. No further Action status has been requested for this site. There are 22 wells associated with this site.

M-602:

There are no UST Program sites in the vicinity of Building M-602.

M-119:

There is 1 former UST Program Site (M-90) in the vicinity of building M-119. Former UST Site M-90 was a 250 Gal. Used Oil tank where a 3-Well Site Check was performed in 3/94 and a No further Action status was granted on 7/22/96. The monitoring Wells associated with this site have been abandoned.

TC-830:

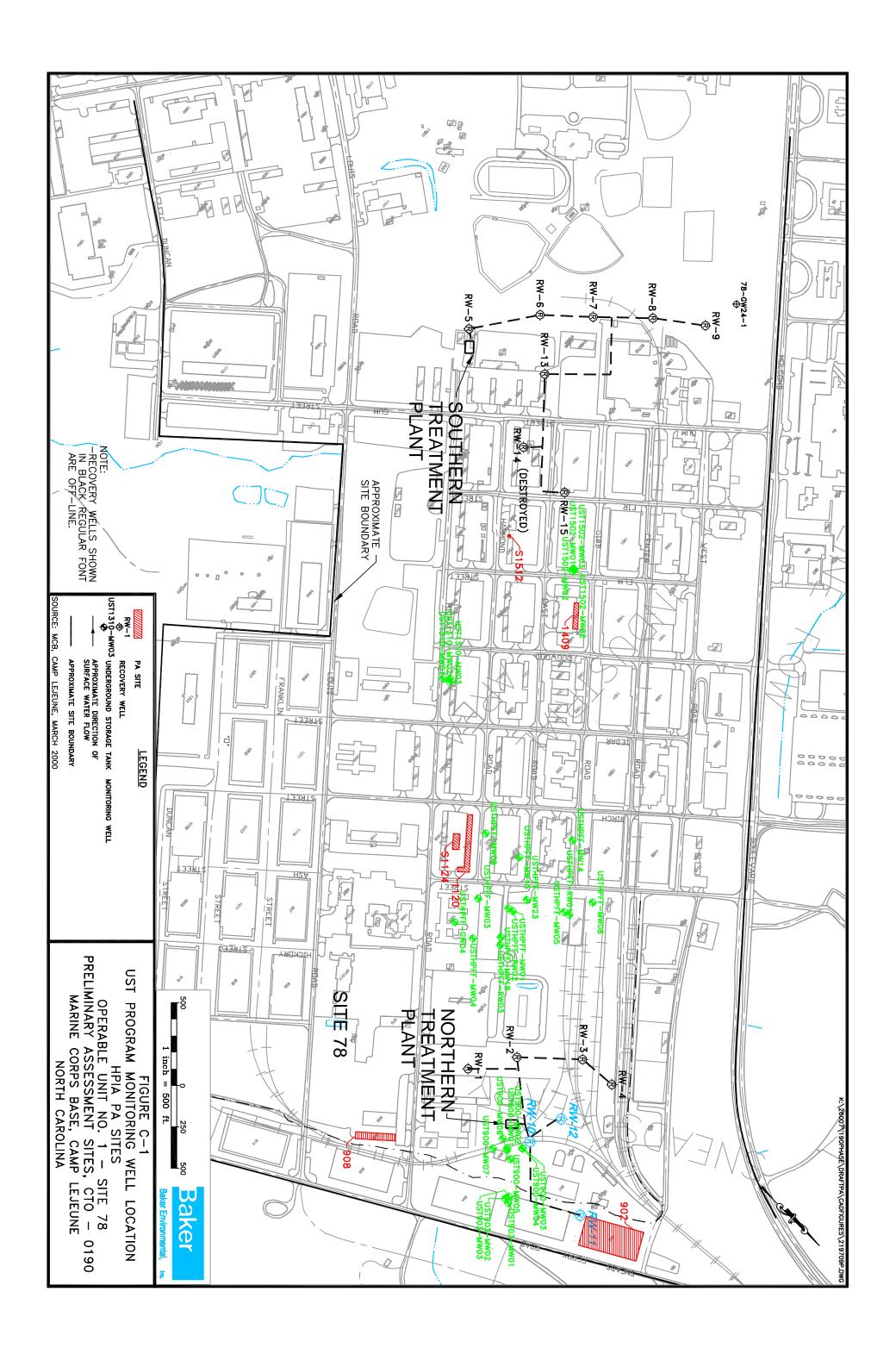
There is 1 Active UST Program Site (TC-755) in the vicinity of building TC-830. A Limited Site Assessment has been requested for UST Site TC-755, a 530 Gal. Diesel tank, on 7/17/01.

AS-116:

There are 3 former UST Program Sites (AS-109/SAS-157, AS-114, AS-118), and 2 Active UST Program Sites (AS-114(new), AS-118(new)) in the vicinity of building AS-116. Former UST Site AS-109/SAS-157 was a 530 Gal. Used Oil tank where a No further Action status was granted on 4/5/01. Former UST Sites AS-114 and AS-118 both had 550 Gal. Used Oil tanks and No further Action status' were granted on 6/18/99 and 3/30/95 respectively. 3-Well site Checks were performed on both sites in 5/93. The monitoring Wells associated with these sites have been abandoned. UST Sites AS-114(new) and AS-118(new) were both hydraulic lift sites where Limited Site Assessments (LSA) were performed in 12/00, the lifts excavated and No further Action status' have been requested for these sites. There is one monitoring well associated with each of the two sites.

AS-113, AS-118, AS-119:

Same as AS-116



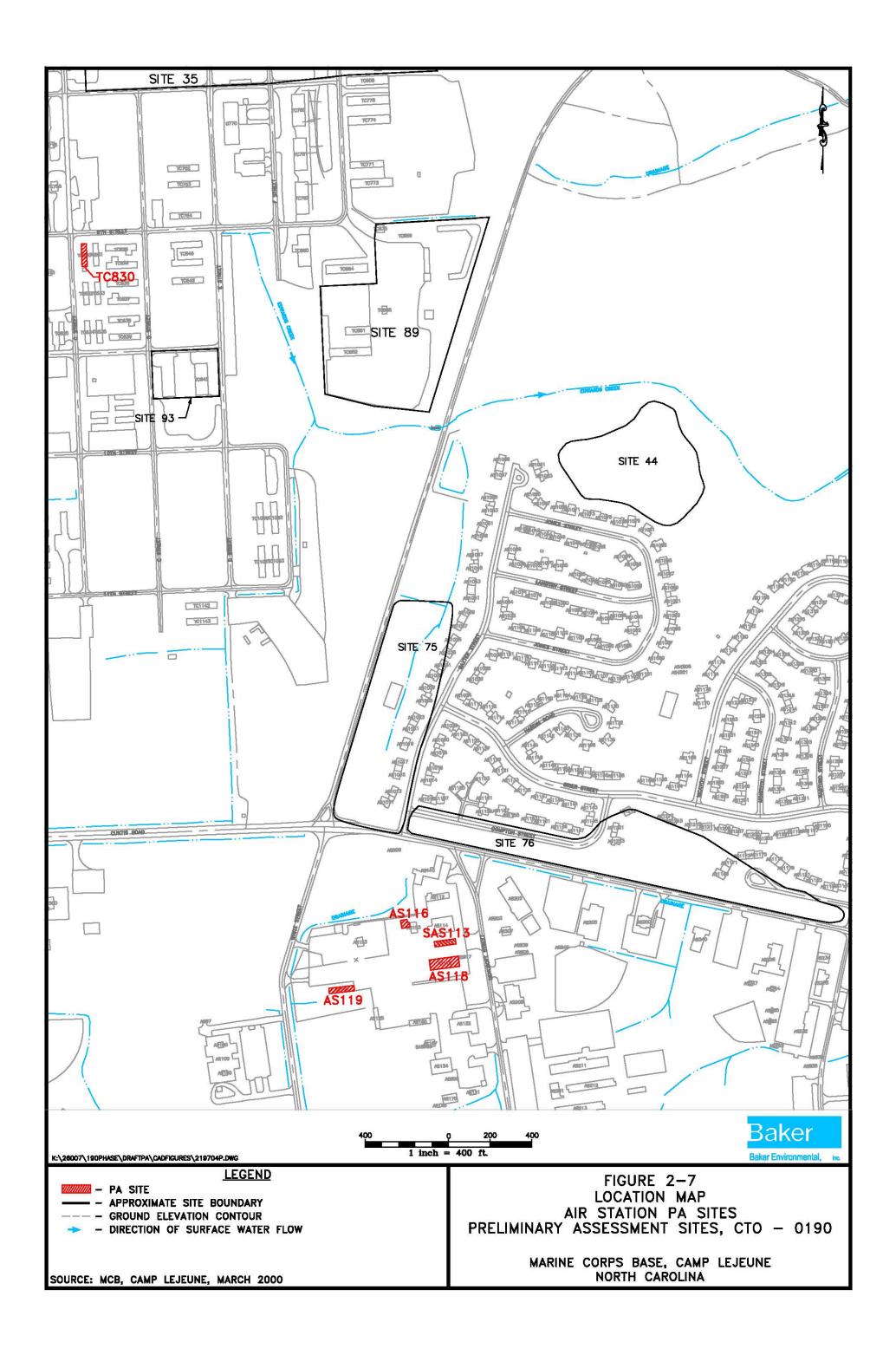


TABLE 1.3C (Page 5 of 10)

SUMMARY OF LABORATORY ANALYTICAL RESULTS * - GROUND WATER SAMPLES JUNE 5, 1997 THROUGH AUGUST 21, 1997

PURGEABLE HALOCARBONS - EPA METHOD 601

HADNOT POINT FUEL FARM/ BUILDING 1115 MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA

	NC GROUND WATER STANDARD*	MW-9	MW-10R	MW-11	MW-15	MW-17	MW-18	MW-19	MW-20
DATE SAMPLED		6/5/97	6/5/97	6/4/97	6/5/97	6/5/97	6/5/97	6/5/97	6/5/97
ANALYTE									
1,1-Dichloroethene	7	BDL	BQL+	BDL	BDL	BDL	BQL+	BDL	BDL
Tetrachloroethene	0.7	BDL	BQL+	BDL	BDL	BDL	BQL+	BDL	BDL
1,2-Dichloroethane	0.38	BDL	BQL+	BDL	BDL	BDL	400.0	BDL	BDL
Trichloroethene	2.8	BDL	BQL+	BDL	BDL	BDL	BQL+	BDL	BDL
1,2-Dichloropropane	0.56	BDL	BQL+	BDL	BDL	BDL	BQL+	BDL	BDL
trans-1,2-Dichloroethene	70	BDL	BQL+	BDL	BDL	BDL	BQL+	BDL	BDL
All other compounds**	Varies	BDL	BQL+	BDL	BDL	BDL	BQL+	BDL	BDL
	·								
TOTALS		BDL	BQL	BDL	BDL	BDL	400.0	BDL	BDL

* All results in ug/L (ppb)

** All compounds listed in Laboratory Analytical Reports in Appendix F.

BDL Below Detection Limits

BQL Below Quantitation Limits
 Elevated practical quantitation limit, refer to Laboratory Analytical Reports in Appendix F.

Shaded areas indicate concentrations in excess of NCAC T15A:02L Standards.

TABLE 5.55 (Page 1 of 3)

SUMMARY OF LABORATORY ANALYTICAL RESULTS - MONITORING WELL GROUND WATER SAMPLES

PURGEABLE HALOCARBONS-EPA METHOD 601

HADNOT POINT FUEL FARM MARINE CORPS BASE CAMP LEJEUNE, NORTH CAROLINA

	N.C. GROUND WATER STANDARD*	MW3	MW4	MW6	MW9	MW11	MW15	MW17
DATE SAMPLED		11/30/95	11/30/95	11/30/95	11/30/95	11/30/95	12/06/95	11/30/95
ANALYTE								
Chloroform	0.19	BDL	BDL	BQL	BDL	BDL	BQL	BQL
1,2-Dichloroethane	0.38	BDL .	BDL	BQL	BDL	BDL	BQL	BQL
Bromoform	0.19	BDL	BDL	BQL	BDL	BDL	BQL	BQL
Naphthalene	21	BDL	BDL	BQL	BDL	BDL	BQL	BQL
All other compounds**	varies	BDL	BDL	BQL	BDL	BDL	BQL	BQL

^{* =} All results in ug/L (ppb)

BDL = Below Detection Limits

BQL = Below Quantitation Limits

Existing wells MW1, MW2, MW10R, MW12, MW16, and MW18 contained free product, therefore they were not sampled.

Existing wells MW7, MW8, MW13, and MW14 could not be located, therefore they were not sampled.

MW5 was replaced by recovery well RW1, therefore it was not sampled.

Interim maximum allowable concentration for naphthalene has been proposed by the NCDEHNR and has been applied to this investigation.

^{** =} All other compounds listed in Laboratory analytical results in Appendix I.

USTHPFF-HADO9

BORING LOG

BORING NUMBER HIPFF9-TOTAL DEPTH 50.0' SITE LOCATION <u>Camp Lejeune</u> <u>Hadnot Point Fuel Farm</u> DRILLED BY MM/AM
LOGGED BY S. HUDSON
DRILLING DATE 11/15/95

DEP	EPTH (FT.) 2.5 Light tan-brown, CLAY with minor silts and fine sands, cohesive, moderate plasticity, low permeability, inorganic.		USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT	
0.0		sands, cohesive, moderate plasticity, low	CL 4-1	Damp	No	7.35	962/ 4-N	
2.5		sands, cohesive, moderate plasticity, low	CL 5-2	Damp	No	4.32	8-12 A-N	0:00
5.0		Tan-brown to light gray, very fine to fine grained, SILTY SAND, moderately cohesive, no plasticity, low to moderately low permeability.	SM S3	Dry	No	6.58	4-3-2-3-5	
7.5		Orange-brown, very fine to fine grained, SILTY SAND, moderately cohesive, no plasticity, low to moderately low permeability.	SM 5-2.	Moist	No	3.24	6-3-3-3-5	- 0', '-
10.0	12.5	(10.0' - 11.0') Brownish-gray, very fine to fine grained, SILTY SAND, moderately cohesive, no plasticity, low to moderately low permeability.	SM S-%	Wet	No	9.6	4-4-5-4-3	- 0.8
		(11.0' - 12.5') Light gray, fine to very fine SAND, with minor silts, moderately sorted, moderately high permeability.	SW					1.0-14.0
12.5		(12.5' - 14.0') Light gray, fine to very fine SAND, with minor silts, moderately sorted, moderately high permeability.	SW S-#		No	18.37	2-2-2-2	11.6
		(14.0' - 15.0') SANDY PEAT, low permeability.	PT					100,000
15.0	17.5	Dark brown, SANDY PEAT, with medium sands, large root fragments, strong organic odor.	PT ₁	Jamp to Dry	No	41.86	1-2-1-1-2	_ 4

REMARKS Grab = Grab Sample

XNote A-N: 42-45.0'

PAGE 1 OF 3

47-48.0'

USTHPFF-MWO9 BORING LOG

BORING NUMBER HIPFF9
TOTAL DEPTH 50.0'

SITE LOCATION <u>Camp Lejeune</u>
<u>Hadnot Point Fuel Farm</u>

DRILLED BY MM/AM
LOGGED BY S. HUDSON

DRILLING DATE 11/15/95

	PLE TH T.)	SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	COUNT	19.2.0
17.5		(17.5' - 19.0') Dark brown, SANDY PEAT, with medium sands, large root fragments, strong organic odor.	PT S-S	Wet	No	15.43	2-4-3-3-3	
		(19.0' - 20.0') Light brownish-gray, very fine to fine grained, SILTY SAND, non-cohesive, loose.	SM					0-02-0
								-
20.0	22.5	Light gray, very fine to medium grained, SAND, trace silts, moderately sorted, moderate permeability.	SW S-9	√ ^{Wet}	No	11.31	4-5-6-5-5	
				·			. ——	1
22.5		Light gray, very fine to medium grained, SAND, trace silts, moderately sorted, moderate permeability.	SW 4.8	✓ Wet	No	27.32	4-4-4-4	27.0
]								o
25.0		(25.0' - 27.0') Orange-brown, very fine to medium grained, SAND, trace silts, moderately sorted, moderate permeability.	SW	Wet 🗸	No	73.12	6-3-2-4-3	20
		(27.0' - 27.5') Greenish-gray, very fine to medium grained, SILTY SANDS, poor to moderately sorted, moderate to low permeability.	SM					2
								6
27.5	30.0	Greenish-gray, very fine to medium grained, SILTY SANDS, poor to moderately sorted, moderate to low permeability.	SM 3	✓Wet	Possible	376	7-2-3-3-3	7
		,						
30.0	32.5	Greenish-gray, very fine to medium grained, SAND, moderate to poorly sorted, moderate permeability.	SW ₃	✓ Wet	Strong	631	3-3-5-4-5	2-32cl
								300-
32.5	35.0	Greenish-gray, fine to medium grained, SAND, moderately sorted, moderate to high permeability.	SP10	✓ Wet	Strong	682	7-4-4-8-3	2.5

BMARKS

PAGE_2_OF_3_

UST HPFF - MWO9 BORING LOG

BORING NUMBER TIPFFS
TOTAL DEPTH_50.0'

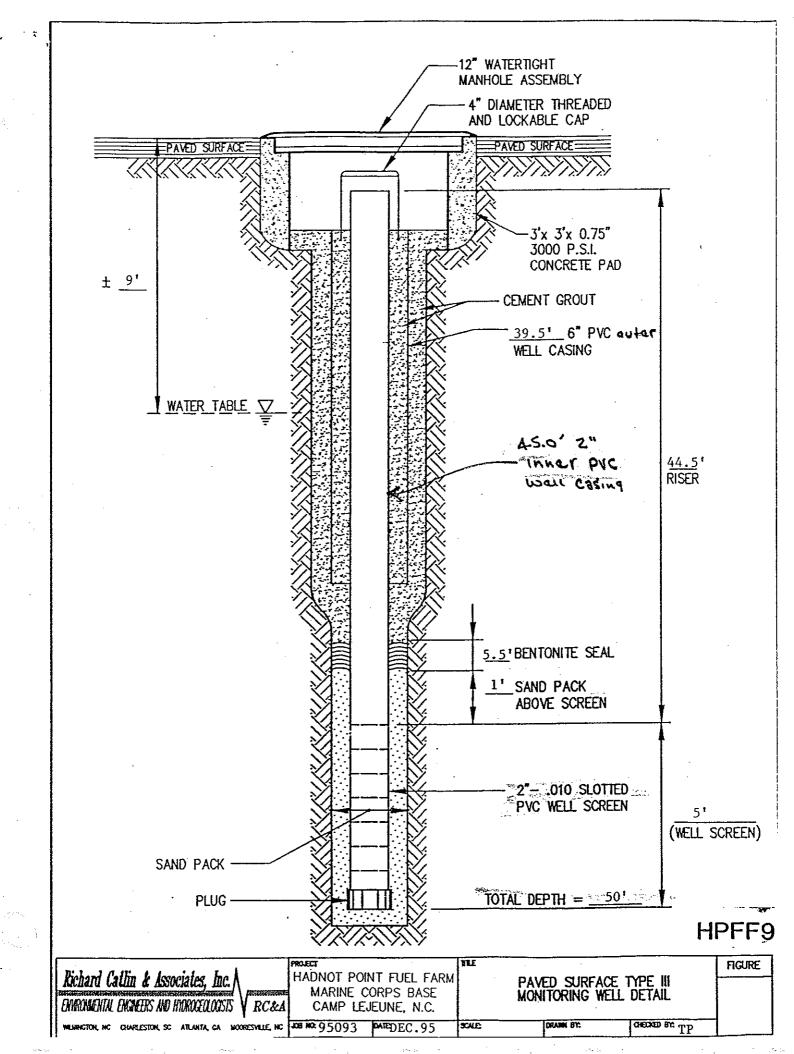
SITE LOCATION <u>Camp Lejeune</u> <u>Hadnot Point Fuel Farm</u>

DRILLED BY MM/AM
LOGGED BY S. HUDSON
DRILLING DATE 11/15/95

SAM DEF (F	TH	SAMPLE DESCRIPTION	USCS	WATER CONTENT	HC ODOR	PID/ FID PPM	BLOW COUNT	7 - 6 - 9
35.0		Greenish-gray and brownish-gray, medium with minor fined grained, SAND, mottled, well sorted, high permeability.	SP.	Wet	Very Strong	823	5-5-5-6-5	22
37.5		Greenish-gray, fine to medium grained, SAND with numerous limestone fragments, moderate to poorly sorted, moderate to moderately low permeability.	SW Vo	√ ^{Wet}	Moderate to Strong	784	13-14-22-16-30	4.0
40.0	42.0	Greenish-gray, medium grained, SANDY LIMESTONE, "clean" limestone, high permeability.	59/15 5-14	Wet	Moderate to Strong	653	17-36-24-48	137
5.0	47.0	Light gray, SANDY LIMESTONE, moderate to moderately well consolidated, fossiliferous, moderate to moderately high permeability, echinoderm spines with sweet odor.	sc/ LS S-X4	✓ Wet	Moderate	326	A-N 32-44-50/3"	40.0 - 4.0
							A-N	
48.0	50.0	Gray, very fine to fine grained gravel, SANDY SILT with clays and numerous limestone fragments, very poorly sorted, angular, cohesive, no plasticity, low permeability, strange sweet odor.	SM S-19	Wet	Possible	194	14-21-17-17	1480.CA
	<u> </u>			·				\dashv

REMARKS_____

PAGE 3 OF 3



NORIH, CAROLINA DEPARTMENT OF ENVIRONMENT, HEALTH AND NATURAL RESOURCES DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION P.O. BOX 27687 - RALEIGH, NC 27611-7687

PHONE: (910) 733-3221

WELL CONSTRUCTION RECORD FOR HPFF9

FOR OFF	ICE USE ONLY
Quad No	Serial No
LatLon	gPc
Minor Basin	
Basin Code	
Header Ent.	GW-1 Ent

	ILLING CONTRACTORRichard Catlin & Associates, Inc. ILLER REGISTRATION NUMBER 1142	STATE WELL CONSTRUCTION PERMIT NUMBER: N/A
1.	WELL LOCATION: (Show sketch of the location below) Nearest Town:Camp Lejeune	County:Onslow
2.	Hadnot Point Fuel Farm (Road, Community, or Subdivision and Lot No.) OWNER LANTDIY NAVFACENGCOM, Commanding General	Depth DRILLING LOG From To Formation Description
	ADDRESS AS/C EMD/Marine Corps Base/PSC Box 20004 (Street or Route No.) Camp Lejeune NC 28542-0004 City or Town State Zip Code	
3.	DATE DRILLED_11/16/95 USE OF WELL _Monitoring	
4.	TOTAL DEPTH_50,0' CUTTINGS COLLECTED X YESNO)
5.	DOES WELL REPLACE EXISTING WELL? YES X	NO SEE ATTACHED
6.	STATIC WATER LEVEL: ± 9.0 FT ABOVE/BELOW TOP OF CASING	
7.	YIELD (gpm): N/A METHOD OF TEST N/A	
	VATER ZONES (depth): Surficial Aquifer	USTHPFF-MWO9
	CHLORINATION: Type: N/A Amount N/A CASING: Wall Thickness Depth Diameter or Weight/Ft. Material From 0.5 To 45.0 Ft. 2 in. SCH40 PVC From 0.5 To 39.5 Ft. 6 in. SCH40 PVC	<u>If additional space is needed use back of form.</u>
11.	GROUT: Depth Material Method From 0.5 To 38.5 Ft. CEMENT TREMIE From 38.5 To 44.0 Ft. BENTONITE CHIPS	
12.	SCREEN:	-1 CEE ATTA CHED
• .	Depth Diameter Slot Size Mater From 45.0 To 50.0 Ft. 2 in010 in. PVC	
13.	GRAVEL PACK: Depth Size Material From 44.0 To 50.0 Ft. TORPEDO SAND	
14	REMARKS:	
	I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN	ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION
7	STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE STANDARDS OF THE STANDARD OF THE STANDARDS OF THE STANDARD OF THE STANDARDS OF THE STANDARD OF THE STANDARDS	DED TO THE WELL OWNER. 12-21-95
GW		ONTRACTOR OR AGENT DATE ivision of Environmental Management and copy to well owner.

APPENDIX D LETTER FOR PRELIMINARY REMOVAL OF EIGHT SITES



UNITED STATES MARINE CORPS

MARINE CORPS BASE.
PSC Box 20004.
Camp Lejeunc, North Carolina 28542-0004

nreflyreuriu 6287 BEMD

Ms. Gena Townsend Remedial Project Manager US EPA Region IV, Atlanta Federal Center Waste Management Division Federal Facilities Branch 100 Alabama Street SW Atlanta, Georgia 30303

1	L	 					
	Note:	2.	11	t-Mou:			_
	L	 		- 	 	 •	_

Dear Ms. Townsend:

Recently Marine Corps Base, Camp Lejeune underwent a study of sites that had not been included in the original Initial Assessment. We reviewed these sites because similar operations at other sites had produced varying degrees of contamination. We had originally identified 20 sites that warranted evaluation based on the Base Facility Department's building identification list. The sites were chosen because the list had them identified as vehicle maintenance yards, laundries, upholsteries, and carpenter shops and these operations had historically resulted in site contamination.

The first step in our review was a historical check done by Navy Historian Jim Dolph. He reviewed archival photographs and documents to determine what these buildings were actually used for in the past. The sites were also reviewed to determine if they were part of investigations at other active sites. Based on this review, we are recommending that eight (8) of the 20 sites be dropped from further investigation. Enclosure (1) is a list of the sites and supporting documentation as to why they should be excluded from further sampling. The remaining 12 sites will continue to be addressed.

If you require additional information or have any questions, point of contact is Rick Raines, Environmental Quality Branch, Environmental Management Division, Installations and Environment Department, at (910) 451-9461.

Sincerely,

SCOTT A. BREWER, P.E.
Director, Environmental Management Division
By direction of
the Commanding General

Enclosure: List of Sites Excluded From Further Investigation

Copy to: NAVFACENGCOM (Mr. K. Stevens Code 1823)

- 438 Noted as a "Dry Cleaning Plant" but only laundry operations were performed here, not dry cleaning operations. Also, no known hazardous substances were used or stored here.
- J1500 Noted as a "laundry" no dry cleaning operations were performed here. Also, no known hazardous substances were used or stored here. There are two wells that border the building (78-GW07 and 78-GW08 which is included in the regular monitoring program); both wells have had consistent non-detections.
- 1502 This site was included due to the fact that it was previously a Motor Transportation Maintenance Facility. The facility has been demolished and is currently under investigation by the UST Section.
- AS-118,- This building is already being studied under the UST and SWMU programs.
- BB-16 Noted as a "Clean & Press Shop and Laundromat" but only laundry operations were performed here, not dry cleaning operations. Also, no known hazardous substances were used or stored here.
- BB-71 This building is already being studied under the UST Program.
- M-602 Noted as a "laundry" no dry cleaning operations were performed here. Also, no known hazardous substances were used or stored here.
- TT-2467 This site is part of a strip mall complex. There were several UST associated with this building. The whole strip mall is undergoing remediation under the UST Section.

APPENDIX E HISTORICAL DRAWINGS

APPENDIX E.1 BUILDING HP902

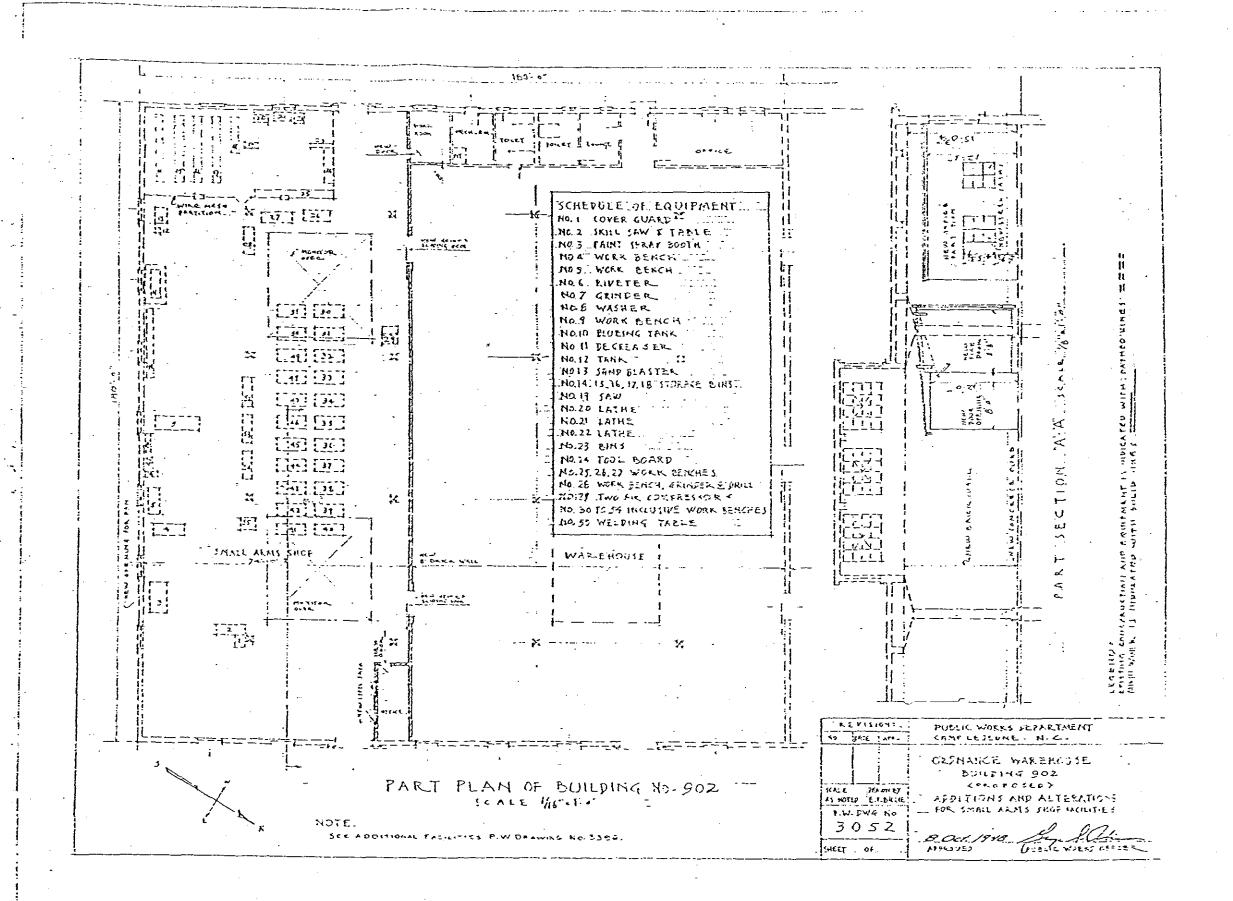


FIGURE HP902-1 HISTORICAL DRAWING PA SITES, CTO - 190 INE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA

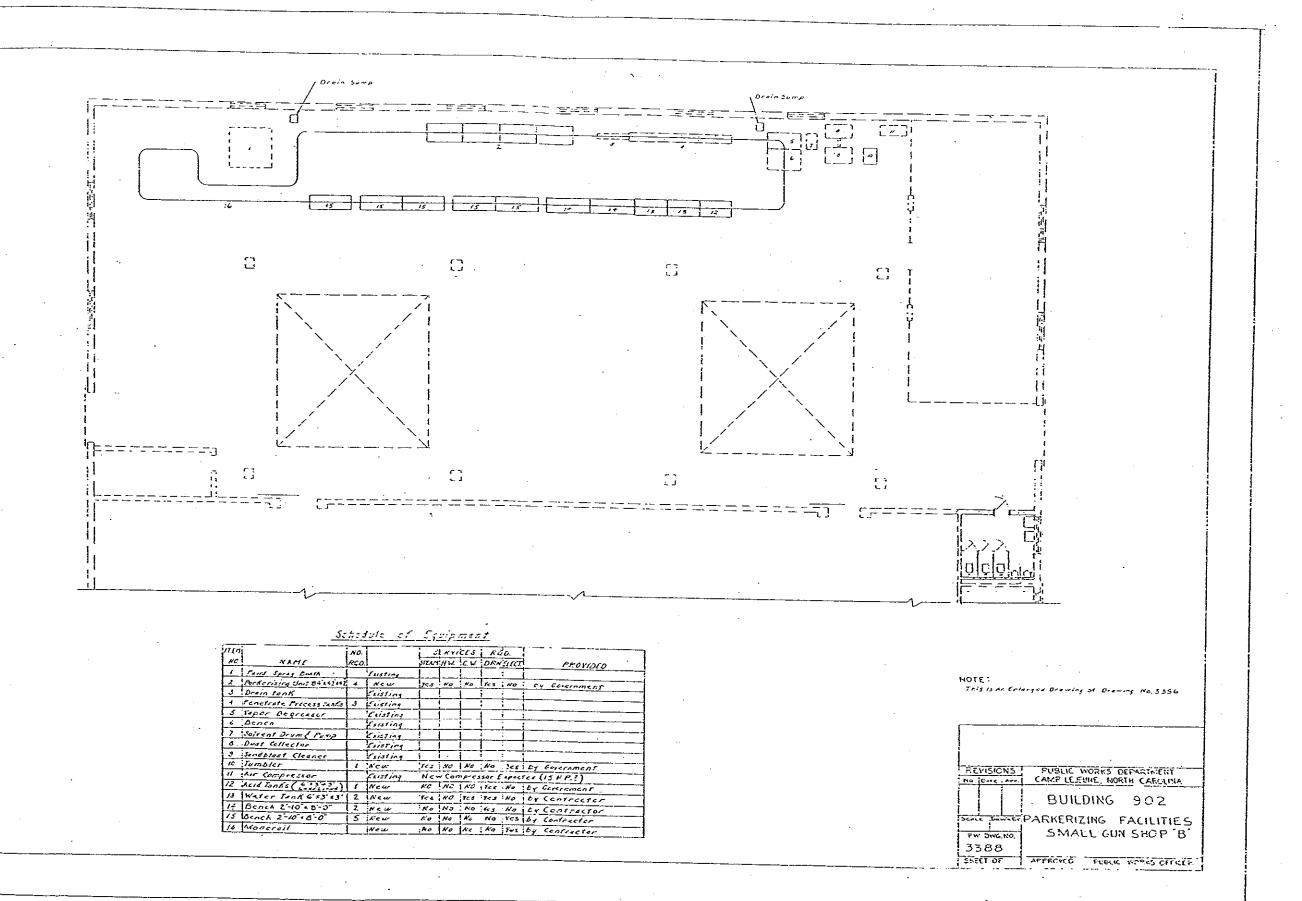
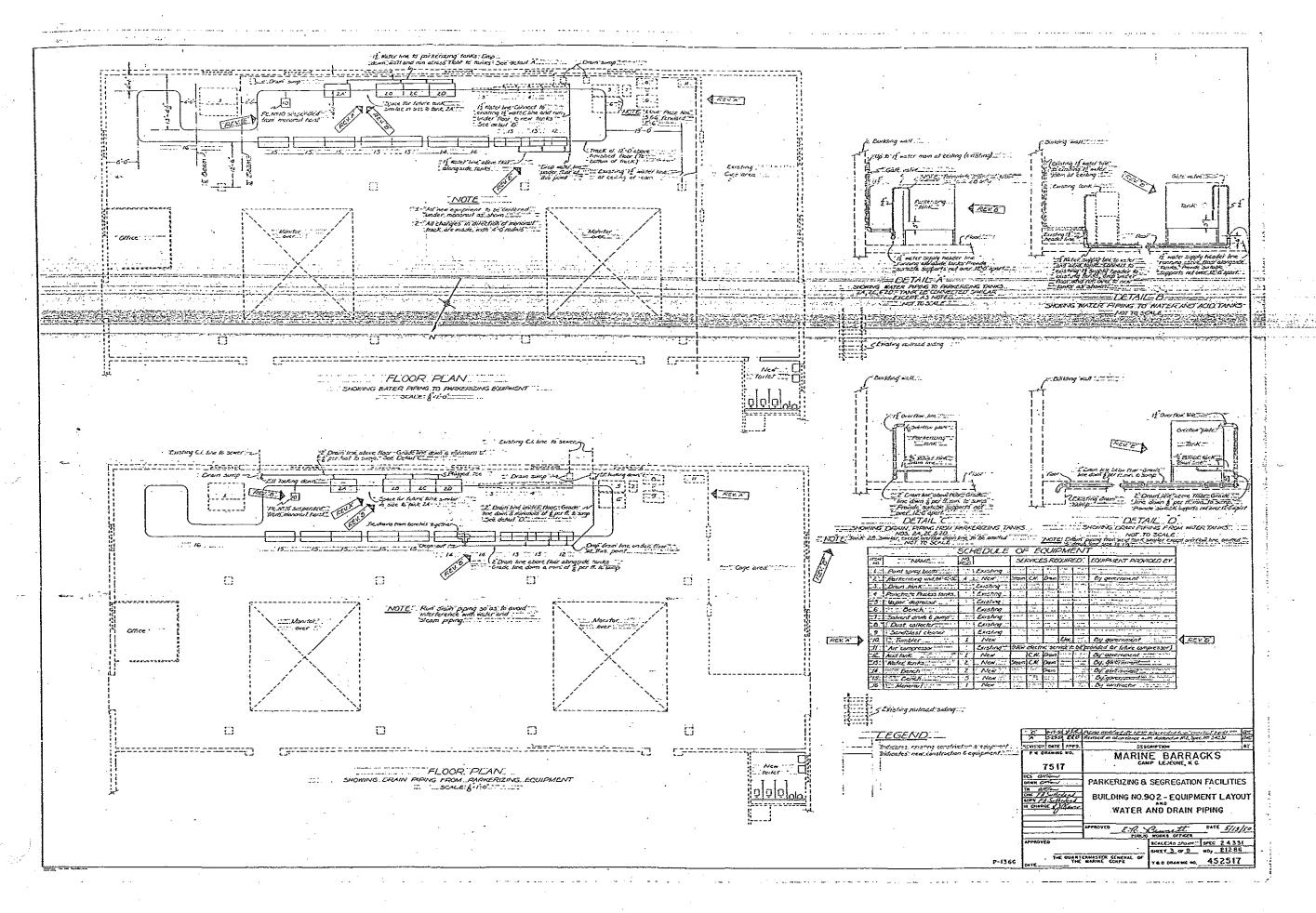
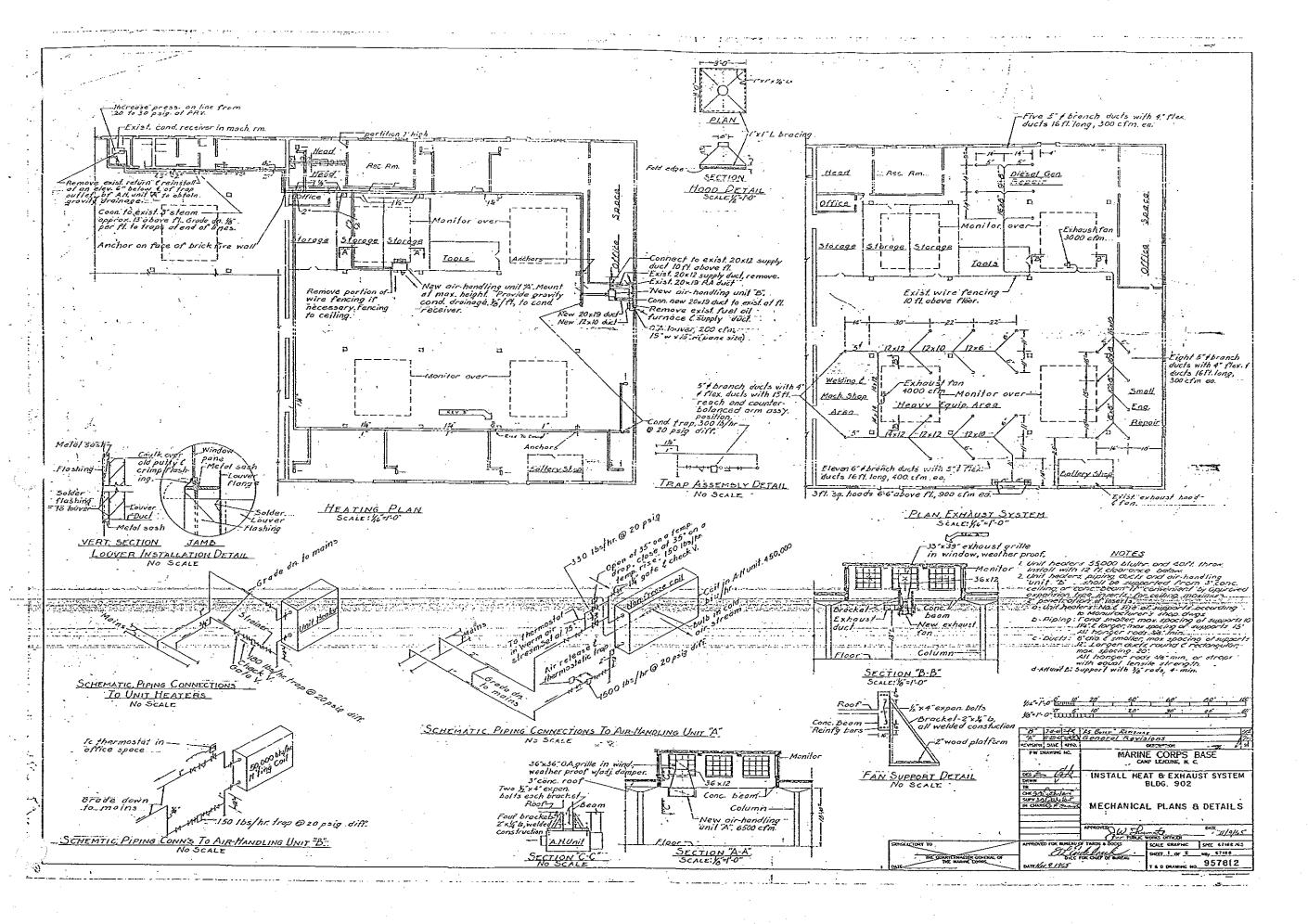


FIGURE HP902—2
HISTORICAL DRAWING
PA SITES, CTO — 190
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

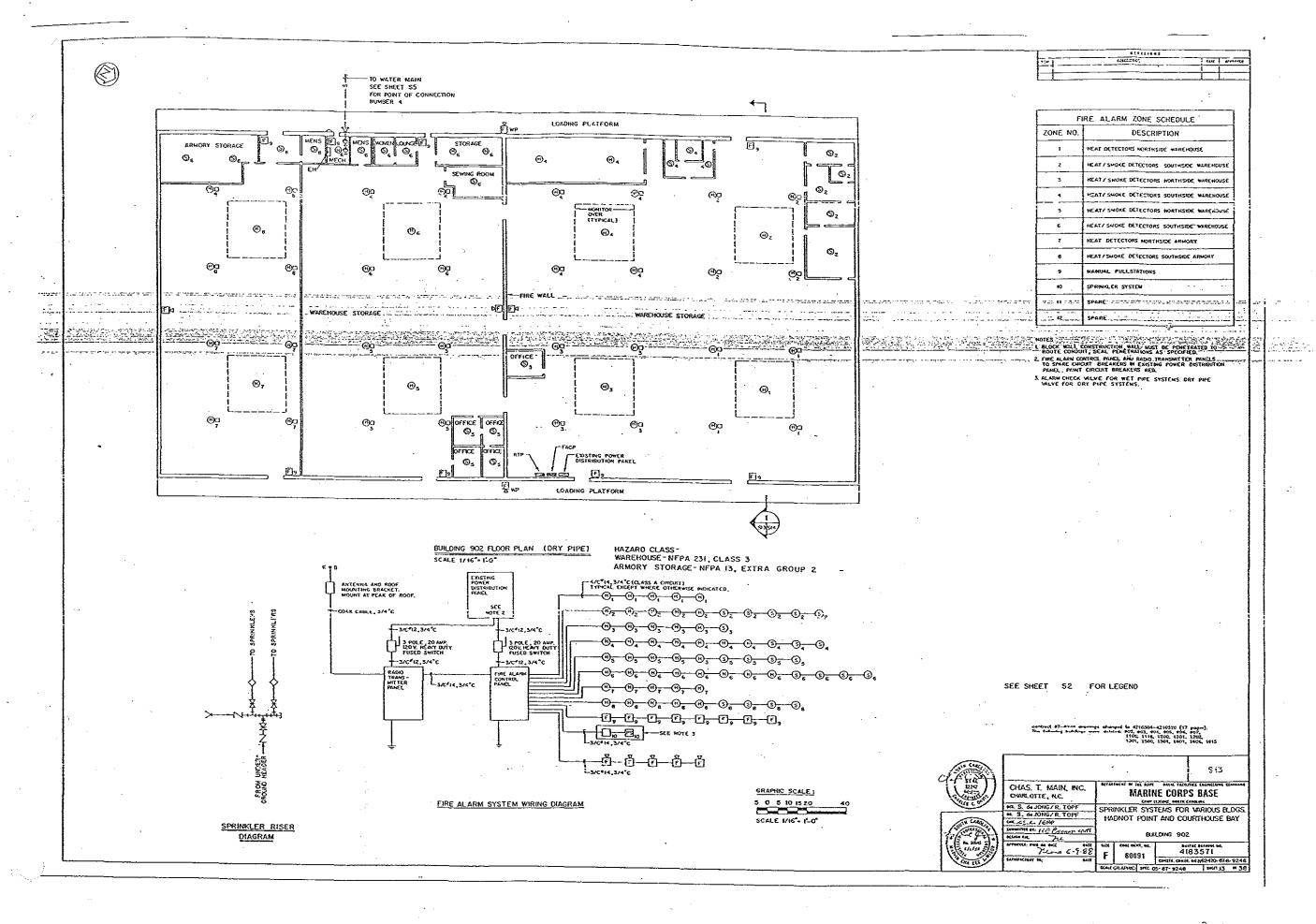


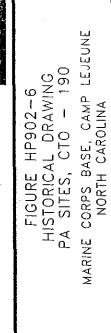


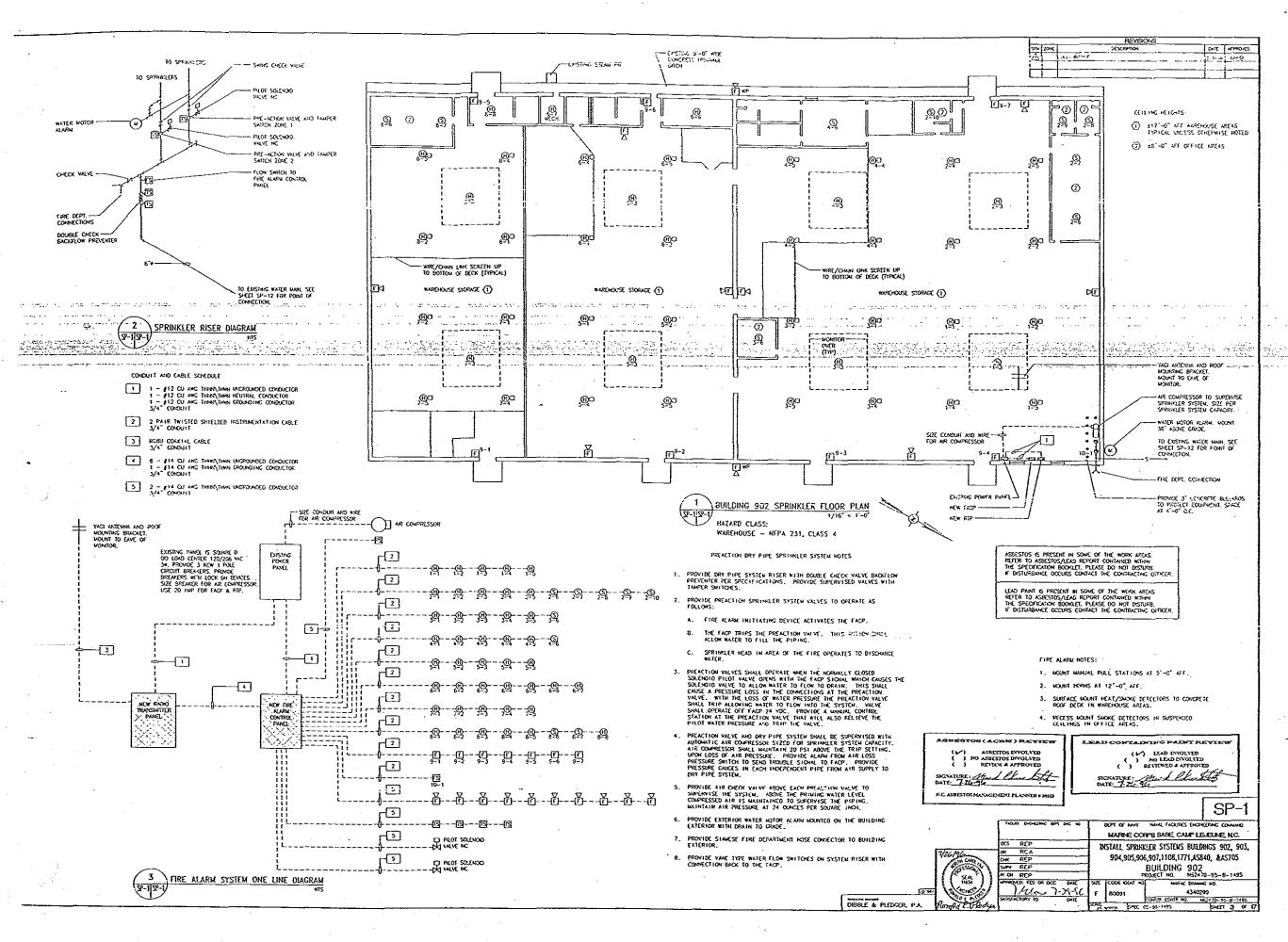


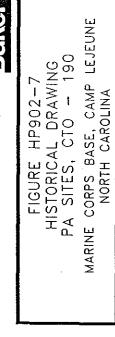


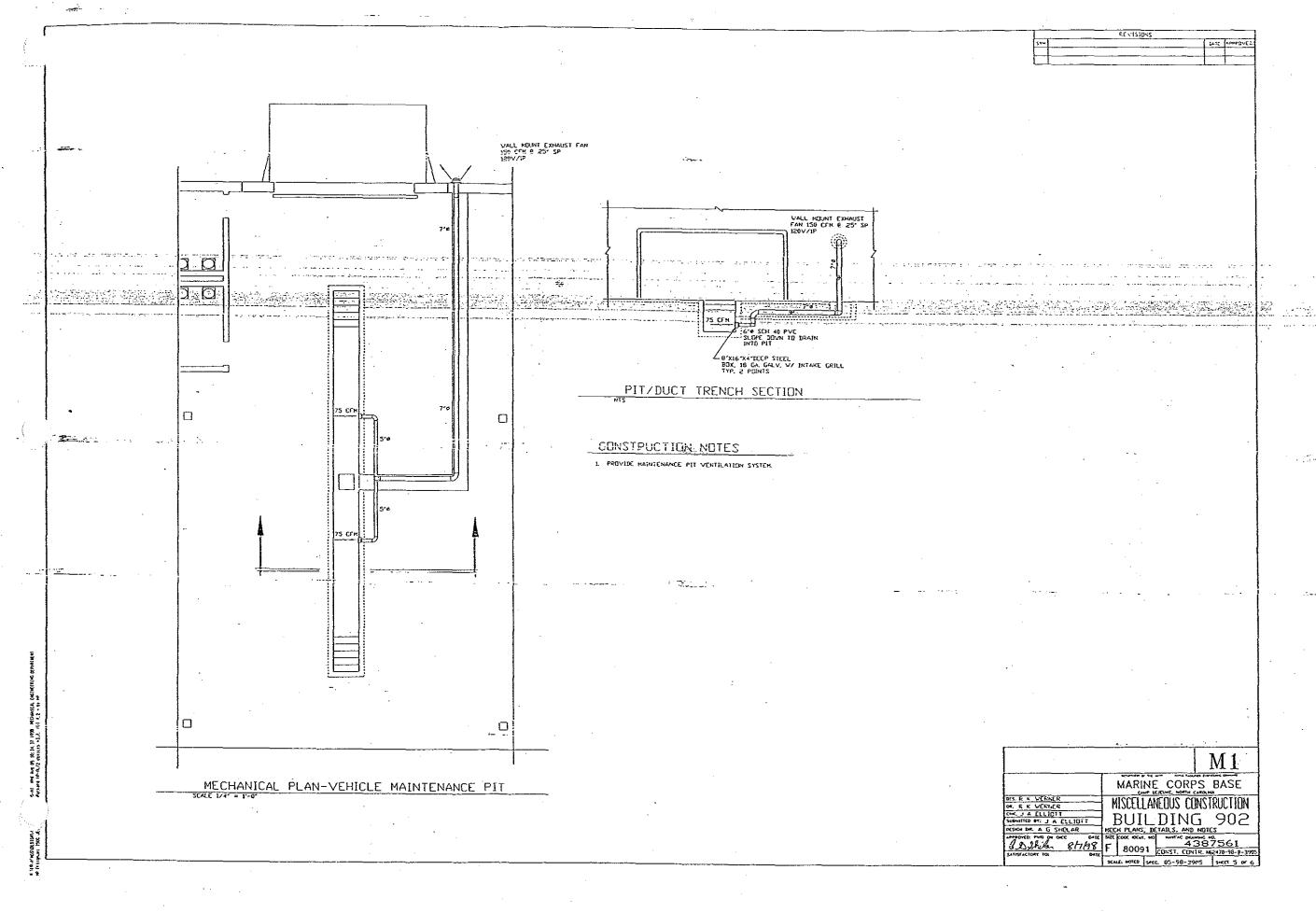






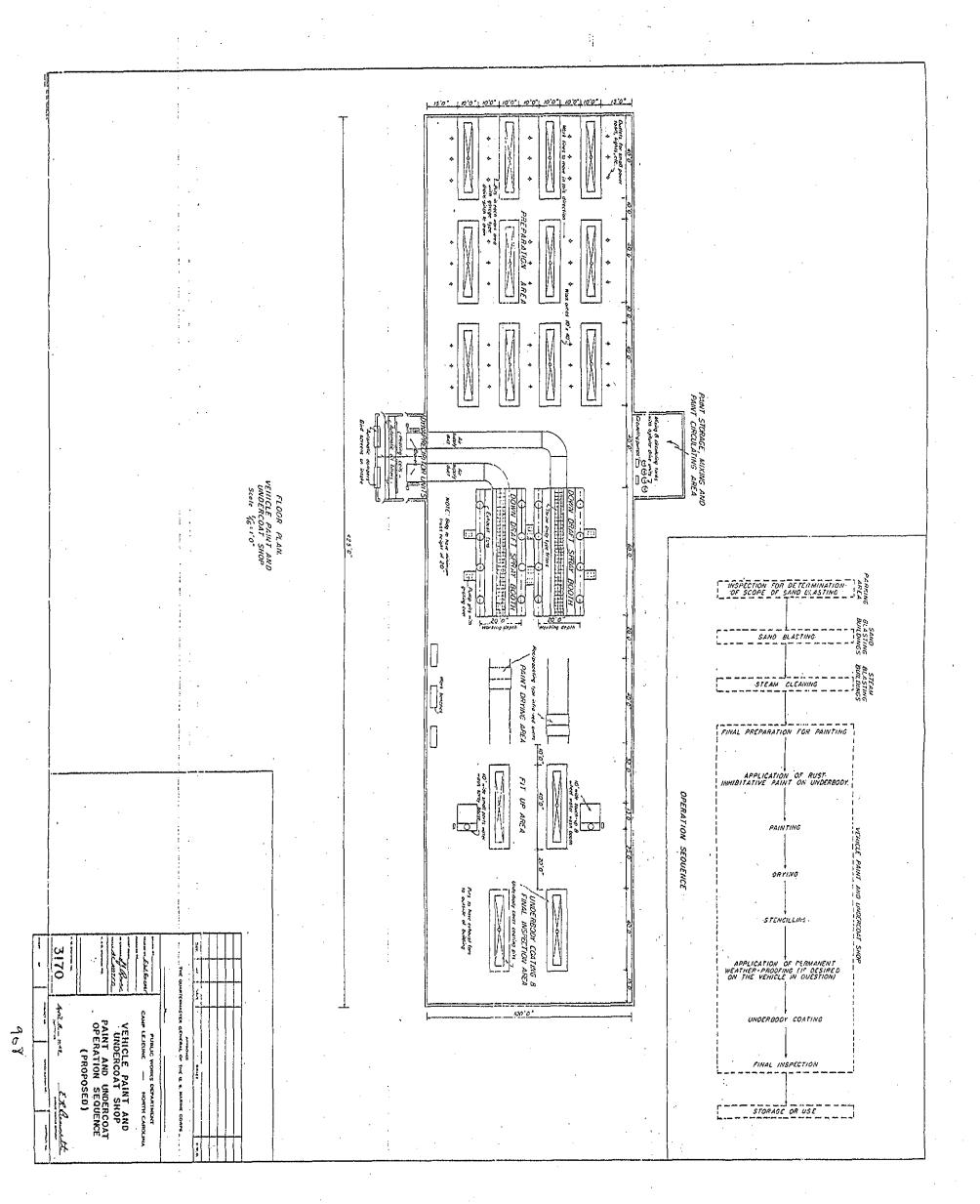






-02

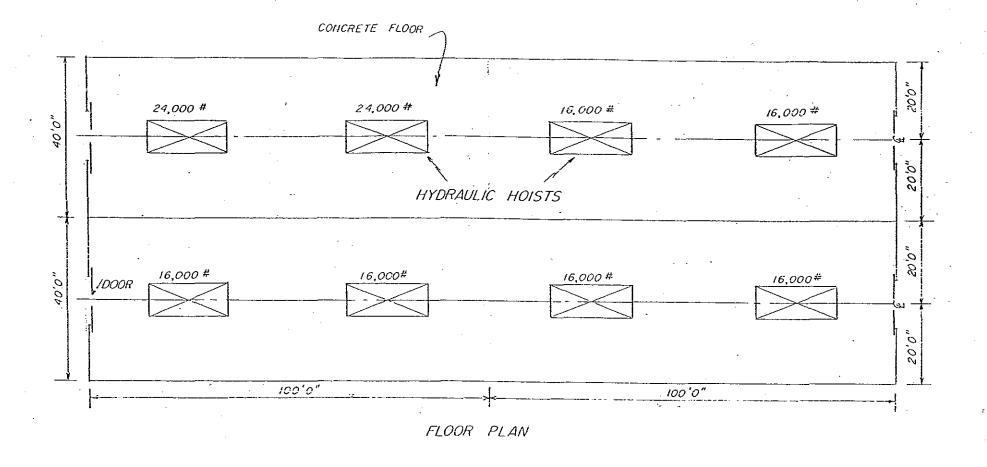
APPENDIX E.2 BUILDING HP908



Baker

FIGURE HP908-1 HISTORICAL DRAWING PA SITES, CTO - 190

MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA



4 - 40 x 100 BUTLER BUILDINGS REQUIRED

PUBLIC WORKS DEPARTMENT. CAMPLEJEUNE, NORTH CAROLINA. REVISIONS No. Date App STEAM CLEANING AND UNDERCOATING BUILDING Scale: Drawn by 1/6"=1's" F.Cons.
P.W.Dws. No. FLOOR PLAN (PROPOSED)

FIGURE HP908—3 HISTORICAL DRAWING PA SITES, CTO – 190 MARINE CORPS BASE, CAMP LEJEUNE

INV. 24.7 ZTO: "B" CONC PIPETS OF THERADE C.I. SOLE PIPE FROM DOWN SPOUTS CONCRETE JUNCTION BASE INT DEATH (ExistiNG). SXSX4TEET TYALYT & BOX BUILDING 909 EEVISIONS SUBTIC WORKS DEPARTMENT. NO. DATE APP. TOAMP LEIEUNET NORTH CAROLLN A AERIAL ZOFR. 19GA. LO.CABLE. LECTRONSTORAGE BLDG 900 1". 30"0" TRACED BY A.L.E. PAINT SPRAY R'M & BAKE OVEN P.W.Dwg No. PAVING LAYOUT 3631 MICHAEL BOAD (EXISTING ASPHALTIC CONCRETE SURFACE) SHEET OF



FIGURE HP908—4
HISTORICAL DRAWING
PA SITES, CTO — 190
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



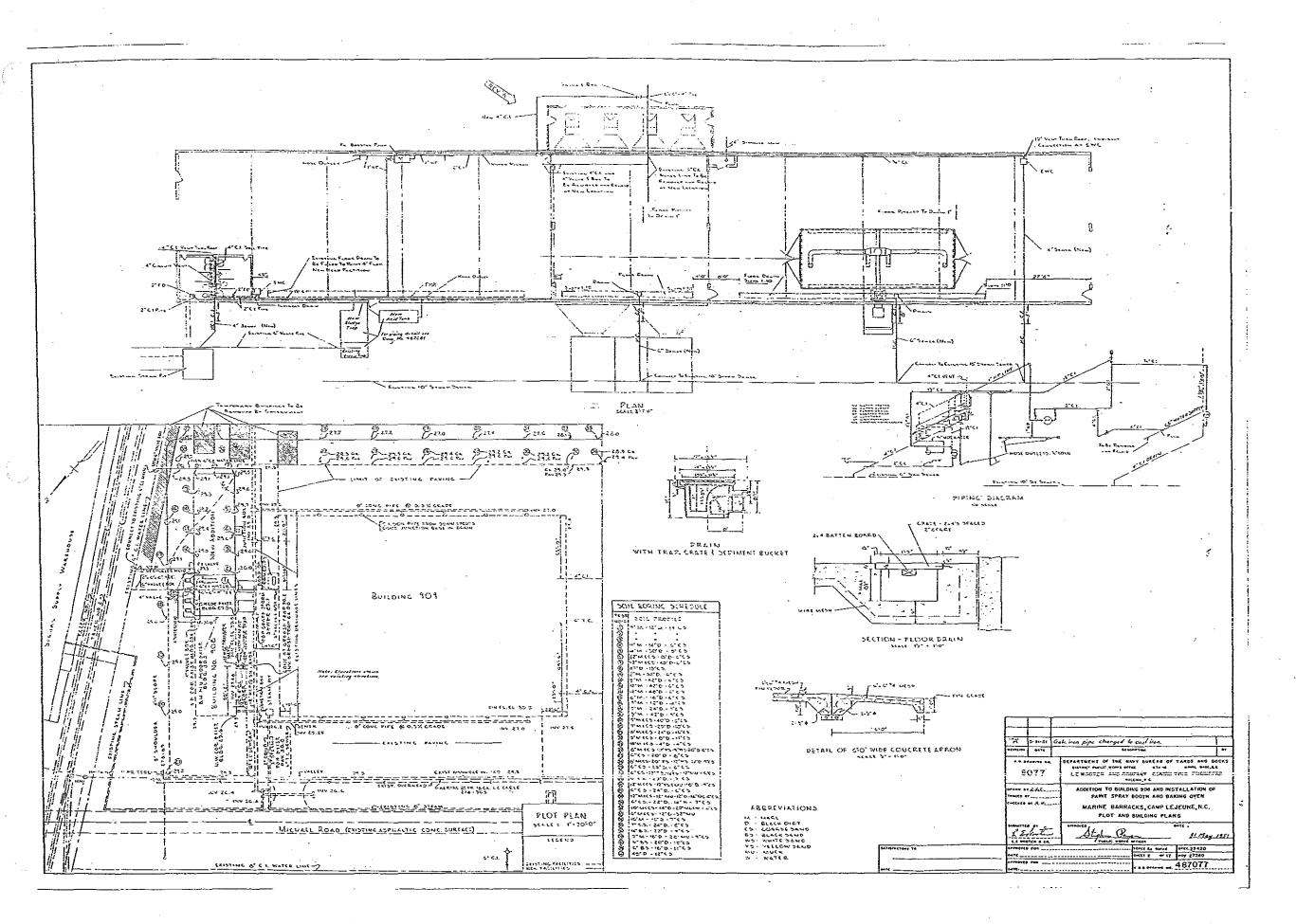
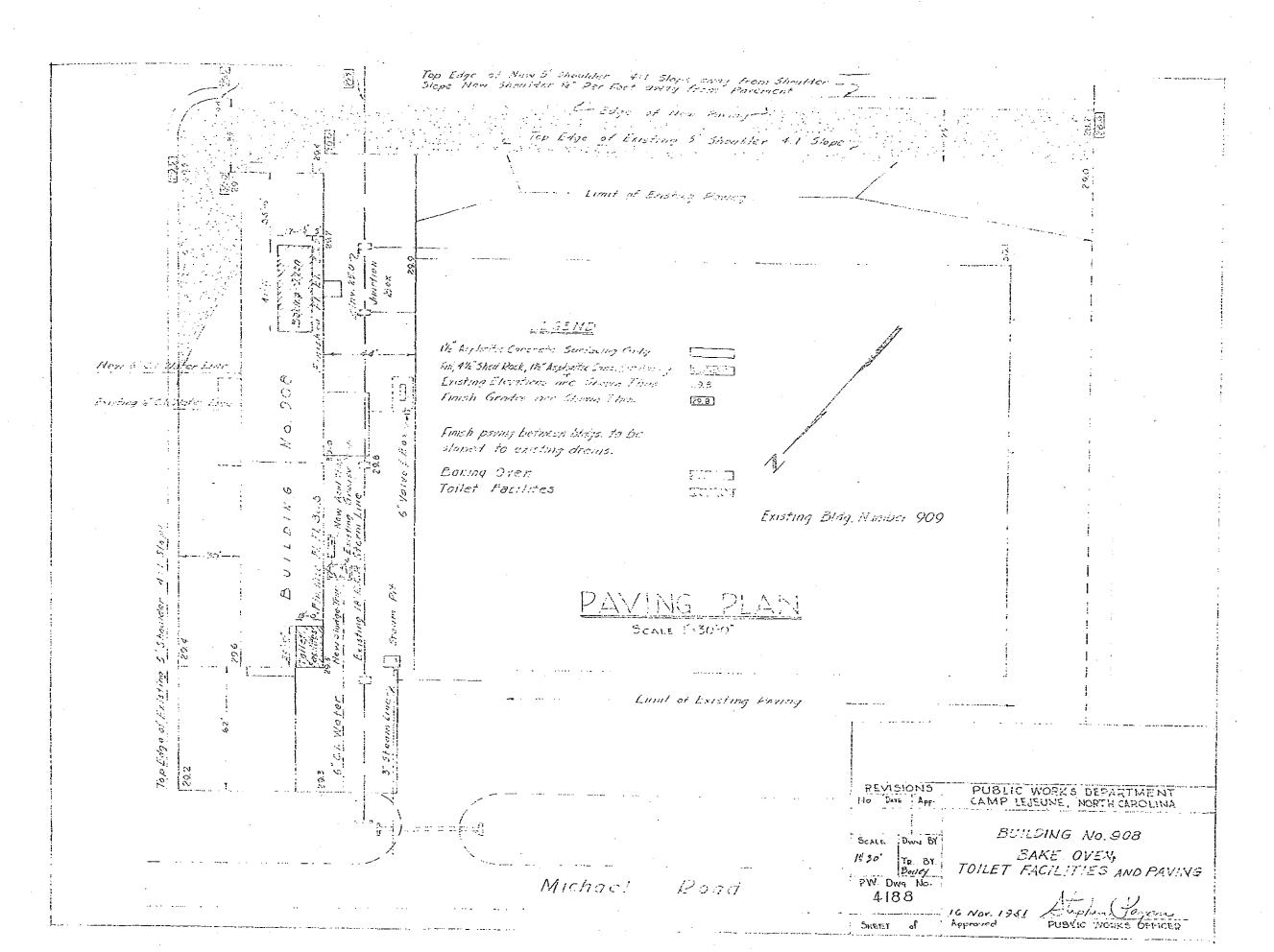
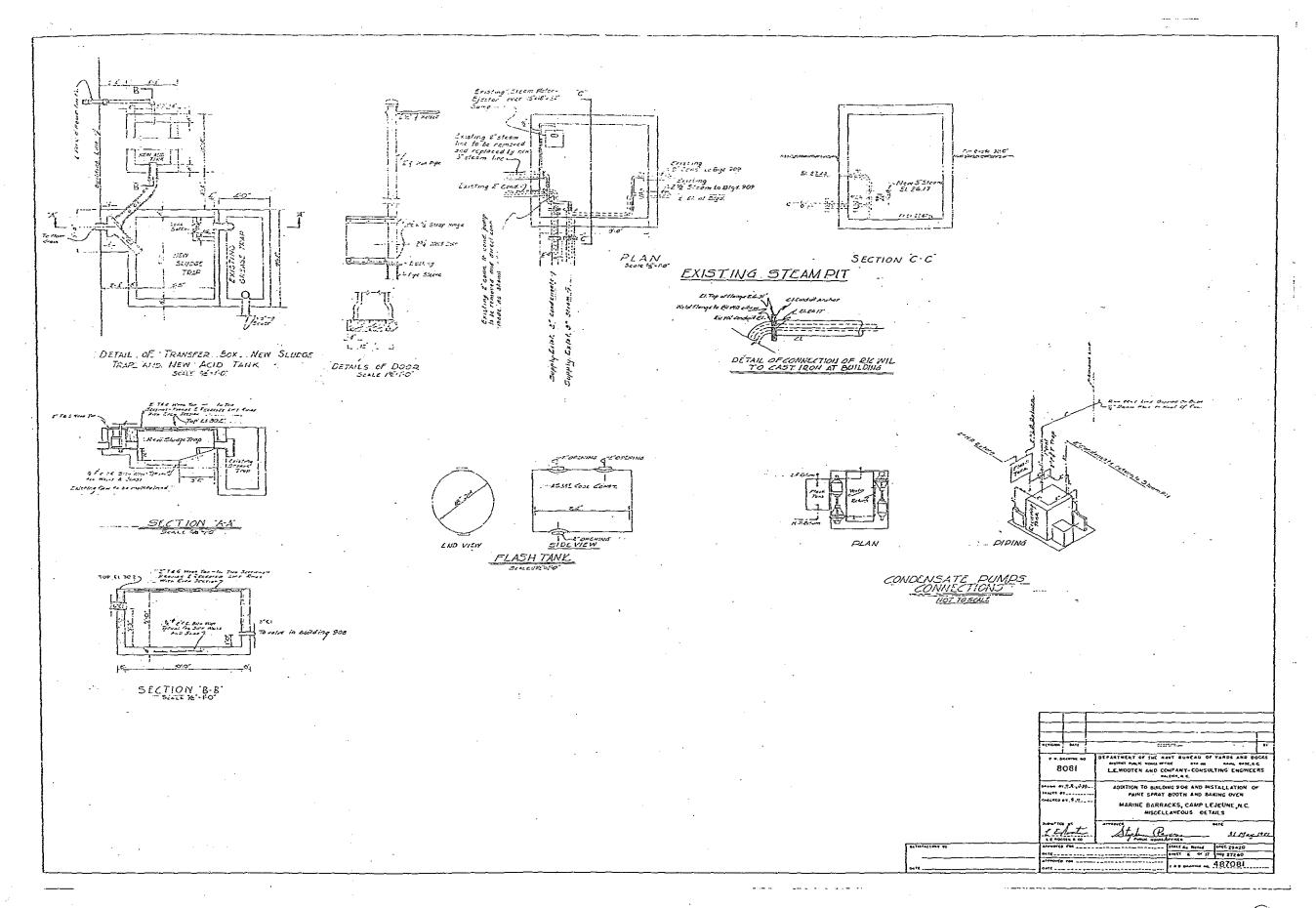
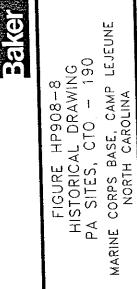


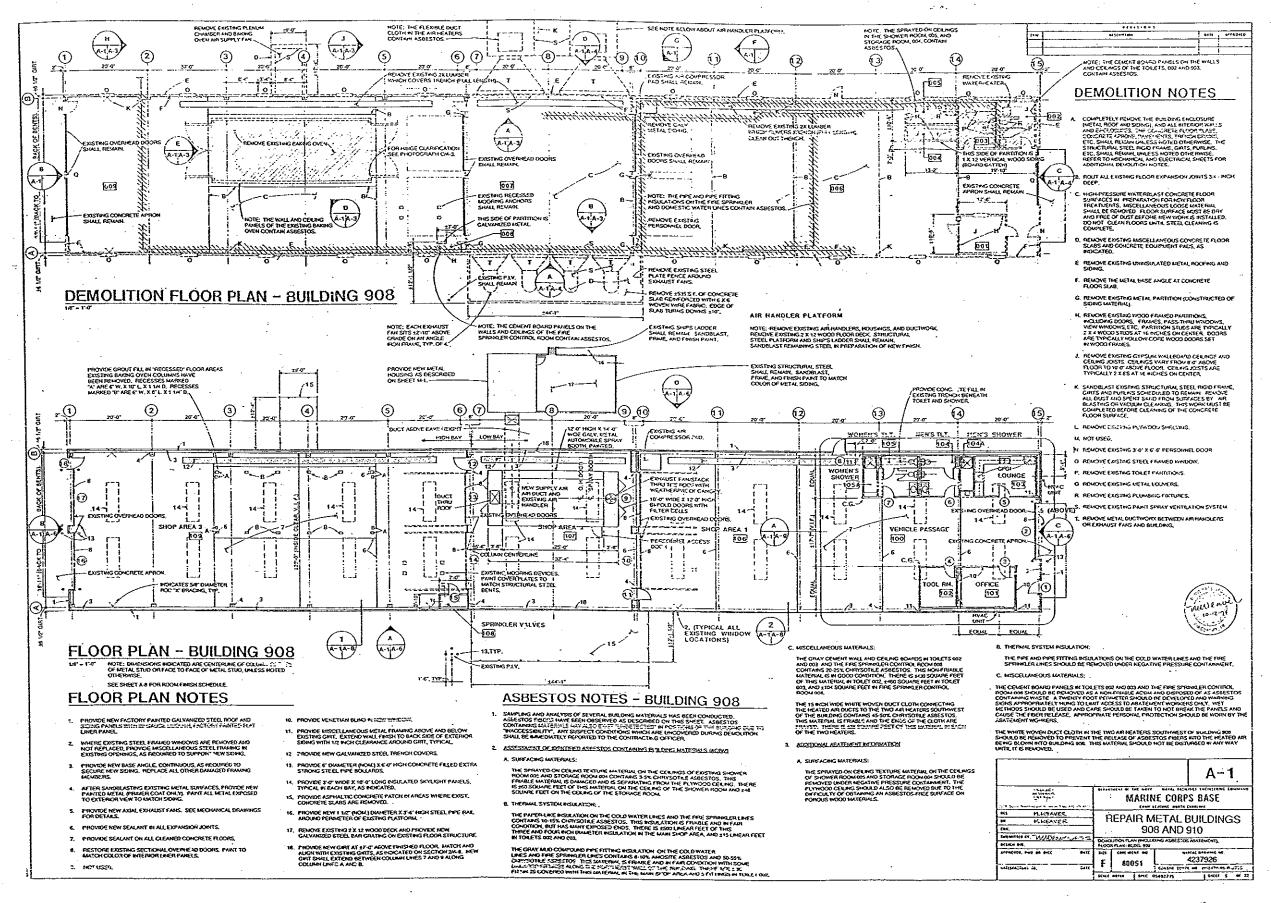
FIGURE HP908—6 HISTORICAL DRAWING PA SITES, CTO — 190 MARINE CORPS BASE CAME IS ITED









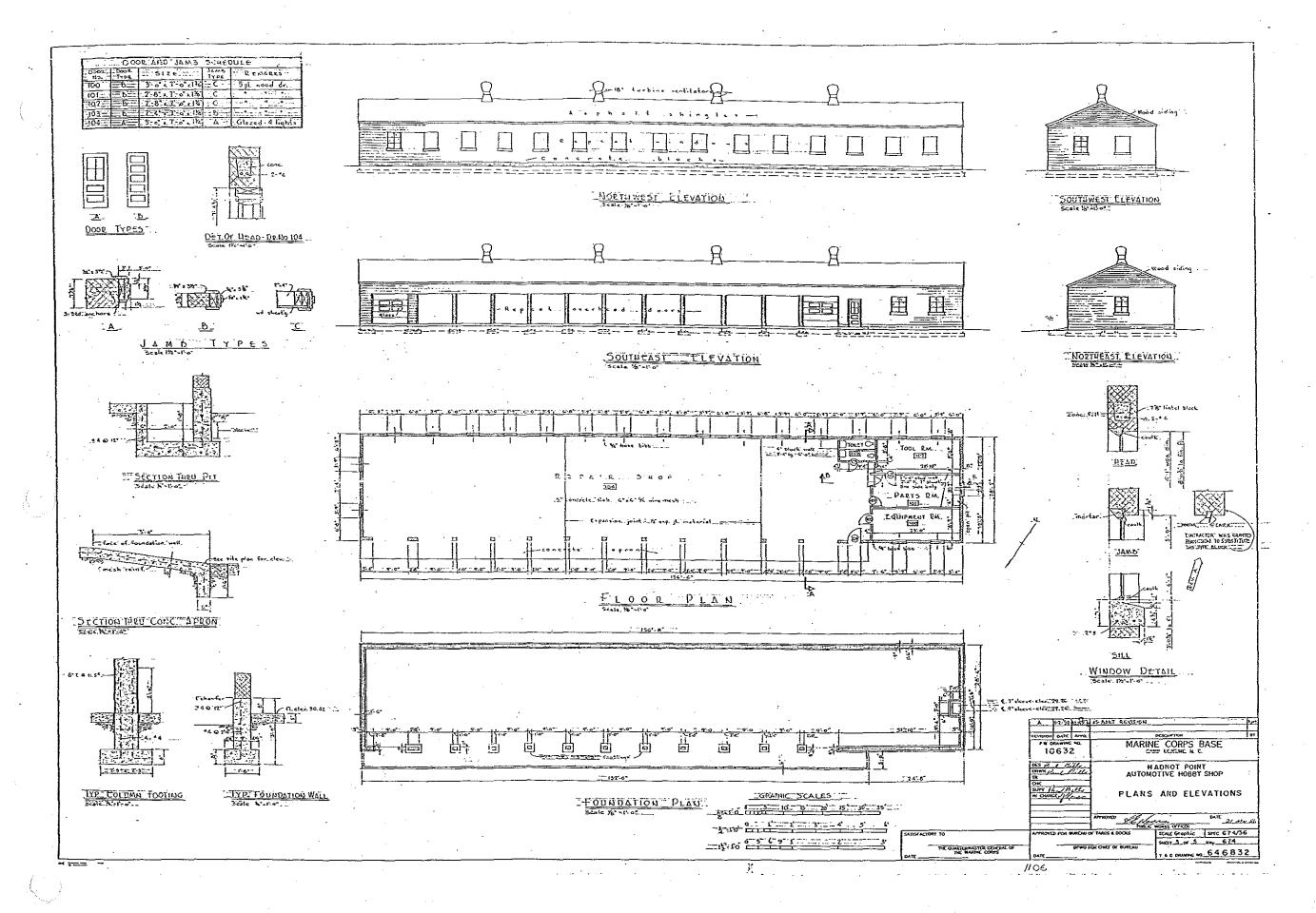


APPENDIX E.3 BUILDING HP1120

CAL DRAWING
S, CTO - 190

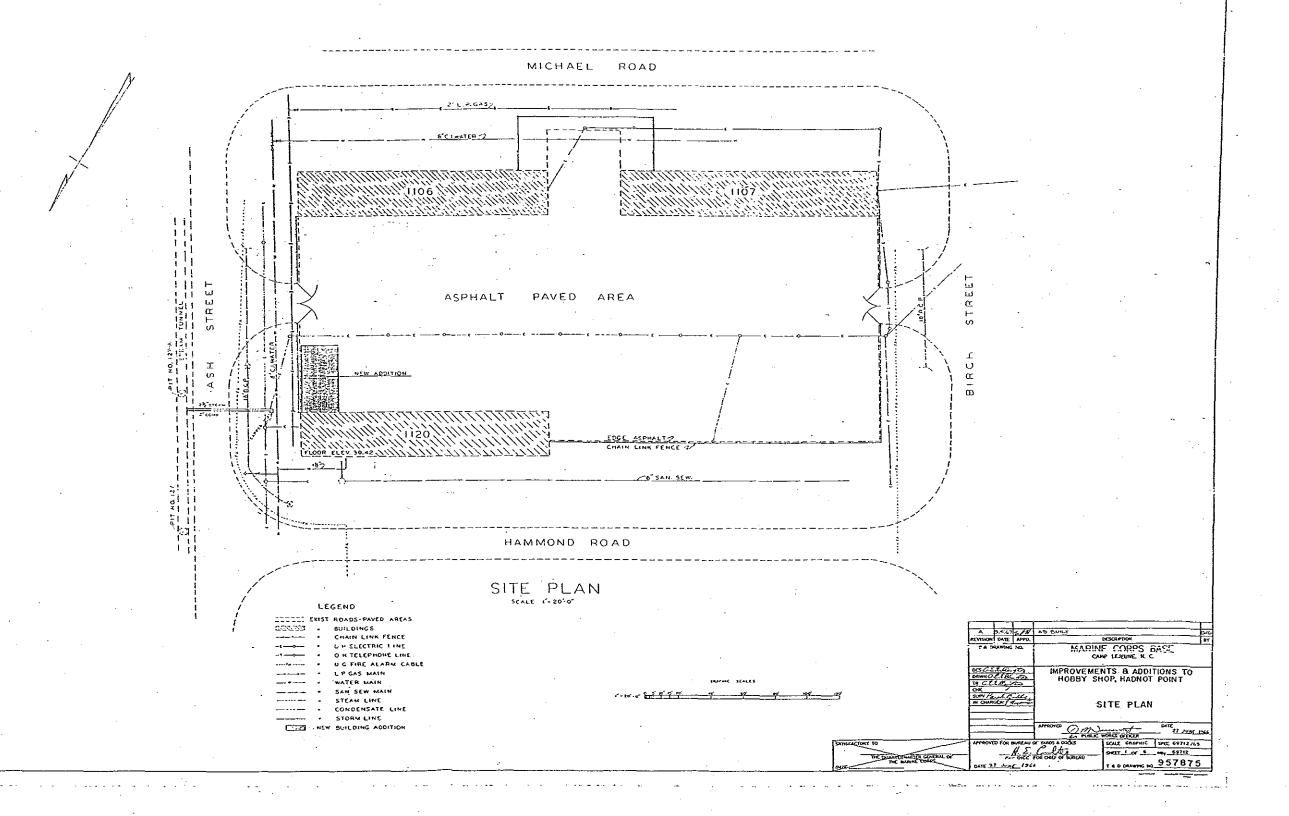
FIGURE HP. HISTORICAL DF PA SITES, CTO

MARINE



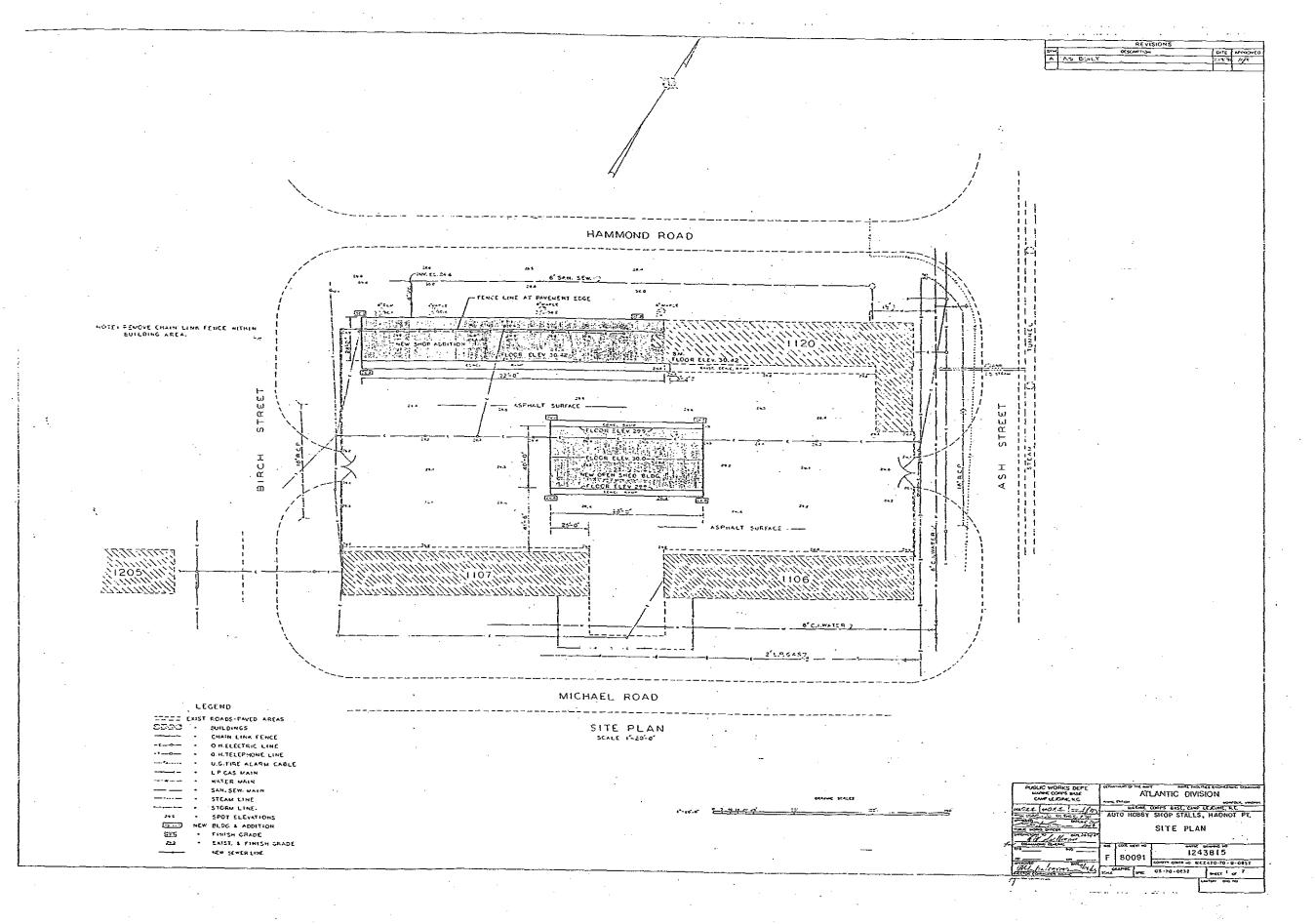
1123

FIGURE HP1120-2 HISTORICAL DRAWING PA SITES, CTO - 190 MARINE CORPS BASE, CAMP LEJEU



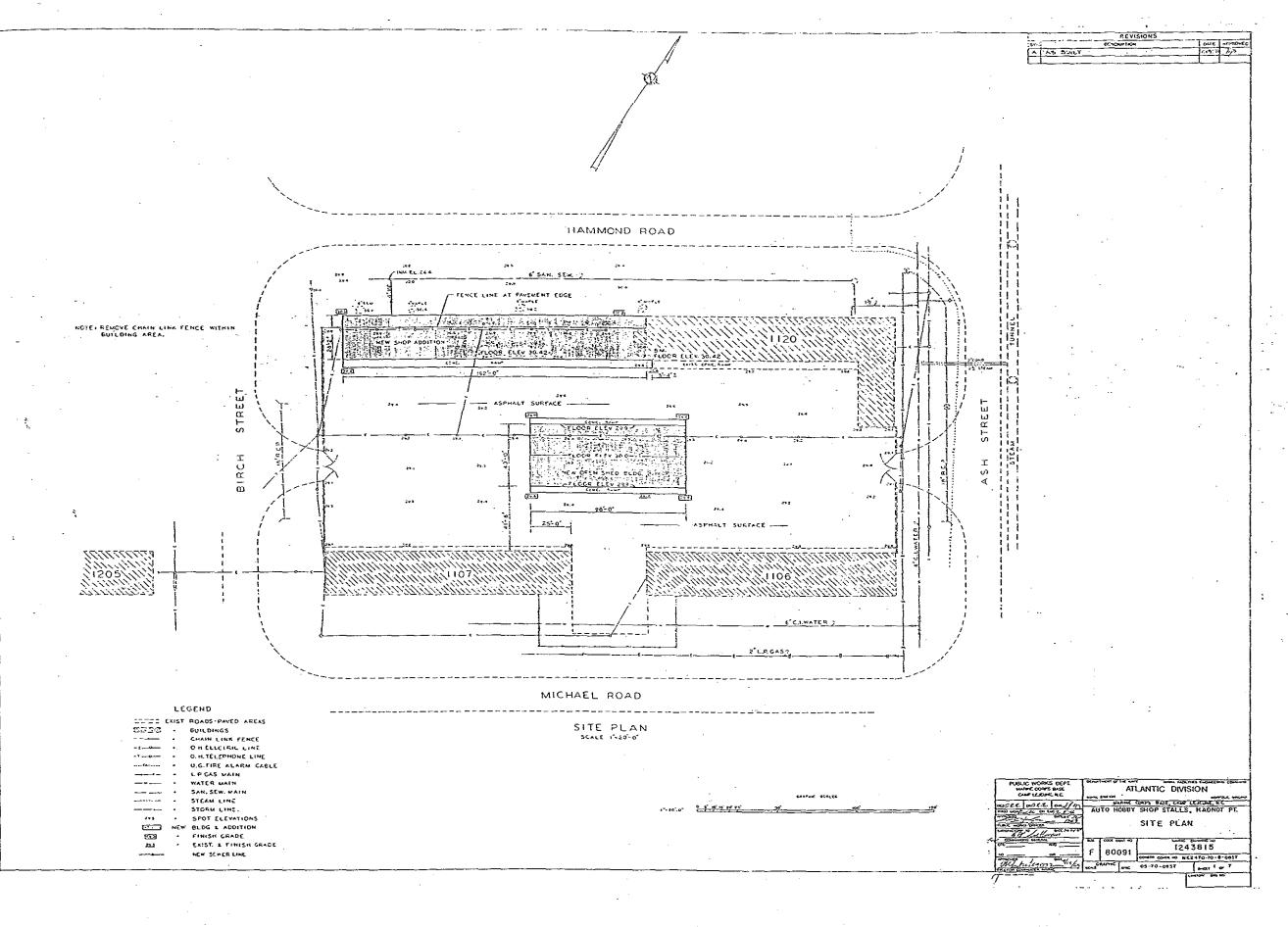
HIMPS



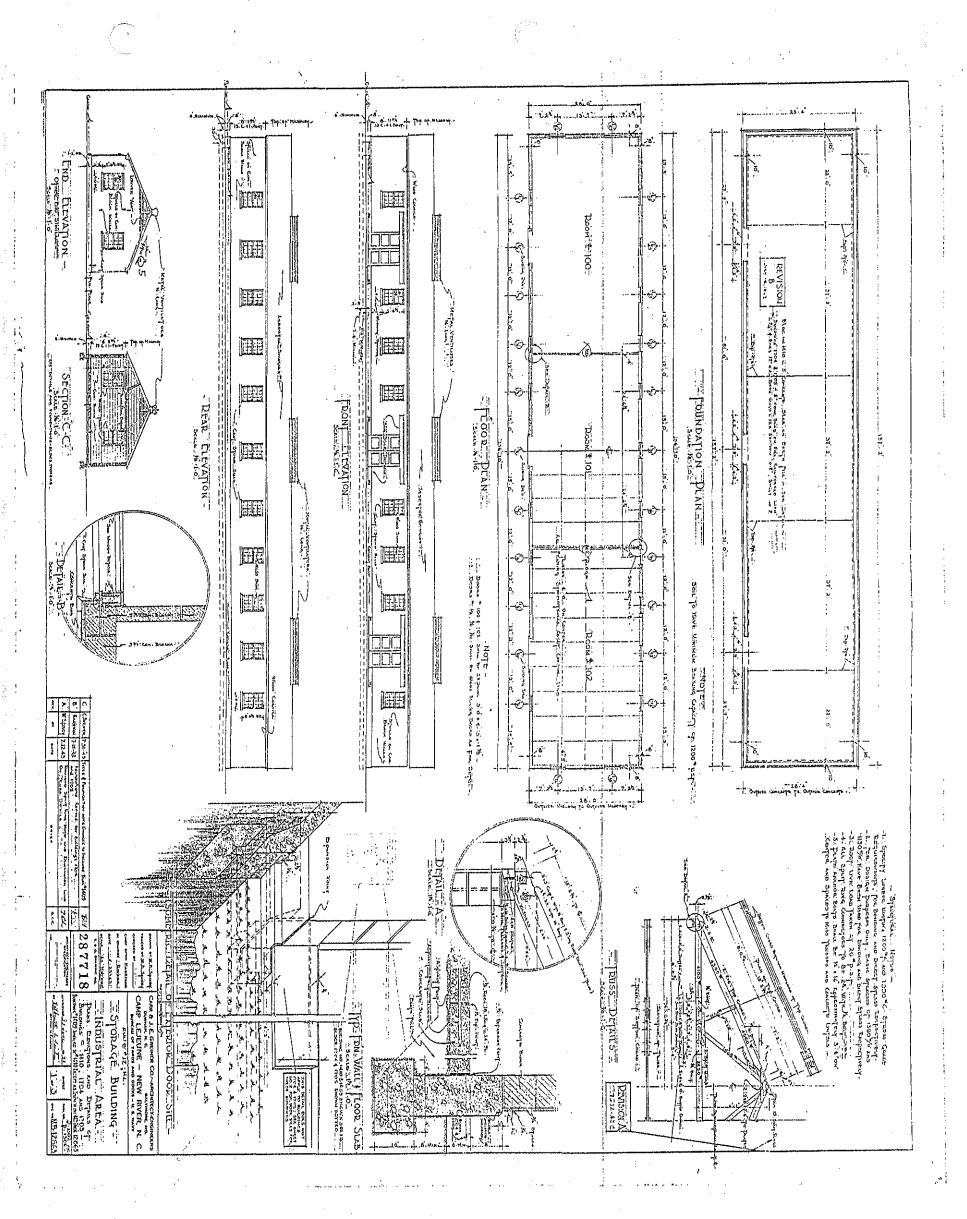


APPENDIX E.4 BUILDING HP1124





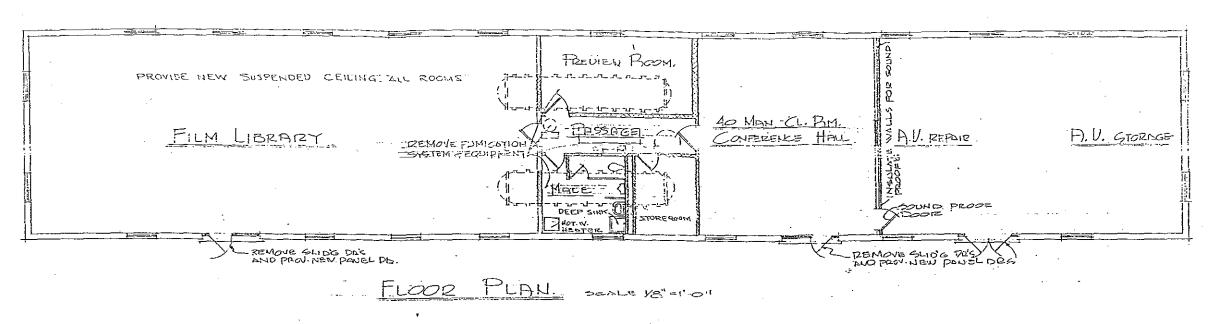
APPENDIX E.5 BUILDING HP1409

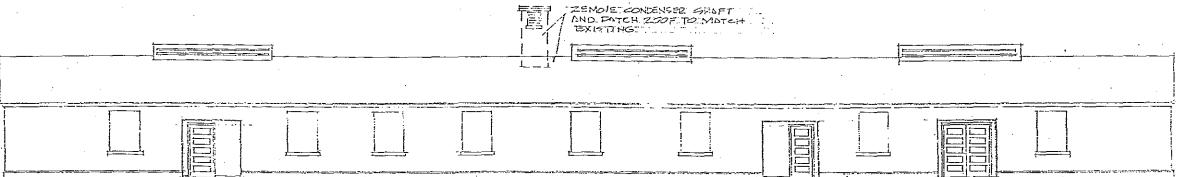


Baker

FIGURE HP1409-1
HISTORICAL DRAWING
PA SITES, CTO - 190
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA







FRONT FLEURION ASSES 10"-1"-0"

EXISTS CONSTR. TO REMAIN.

EXISTS CONSTR. TO REMAIN.

EXISTS CONSTR. TO BE REMOVED

EXIST WENT WOOD STUD WALL CONSTR.

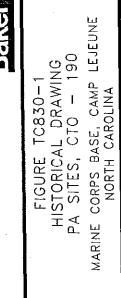
WITH DRY: WALL INTERIOR & PLYND EXTERIOR

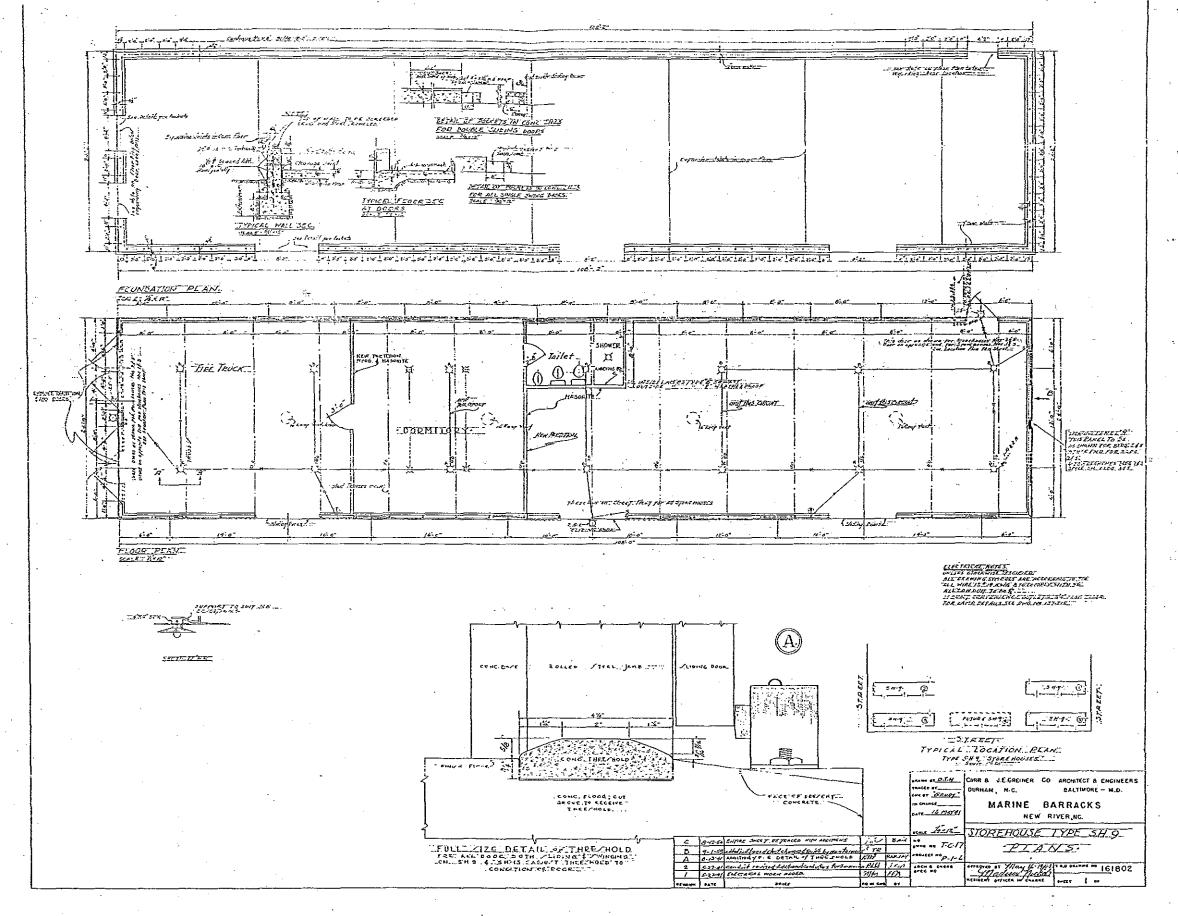
VEW MASONIZY INTERIOR PARTITION.

CONDENSES CHAPTE STRUCTURE TO THE BE REMOVE

MARINE CORPS BASE CAMP LEJEURE, RORTH CAROLI 15, W. ERAWING NO. DES TOAJ PROFOSED - //SCT TRAINING SUPPOR Chr Land CENTER BLDG. 140

APPENDIX E.6 BUILDING TC830



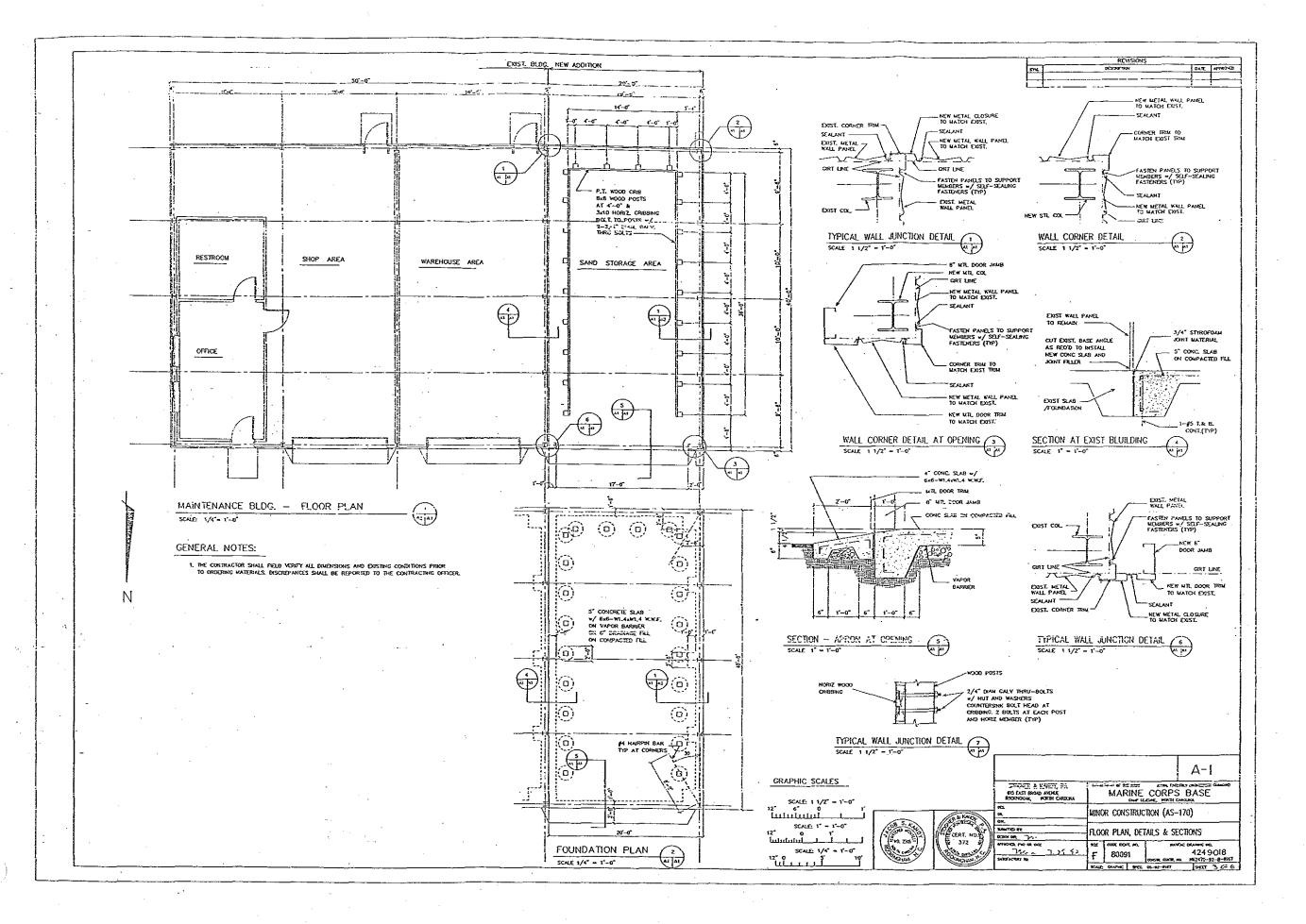


(C830

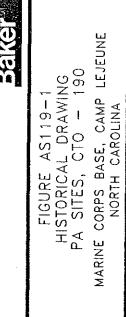
APPENDIX E.7 BUILDING AS116

FIGURE AS116—1
HISTORICAL DRAWING
PA SITES, CTO — 190
RINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

MARINE



APPENDIX E.8 BUILDING AS119



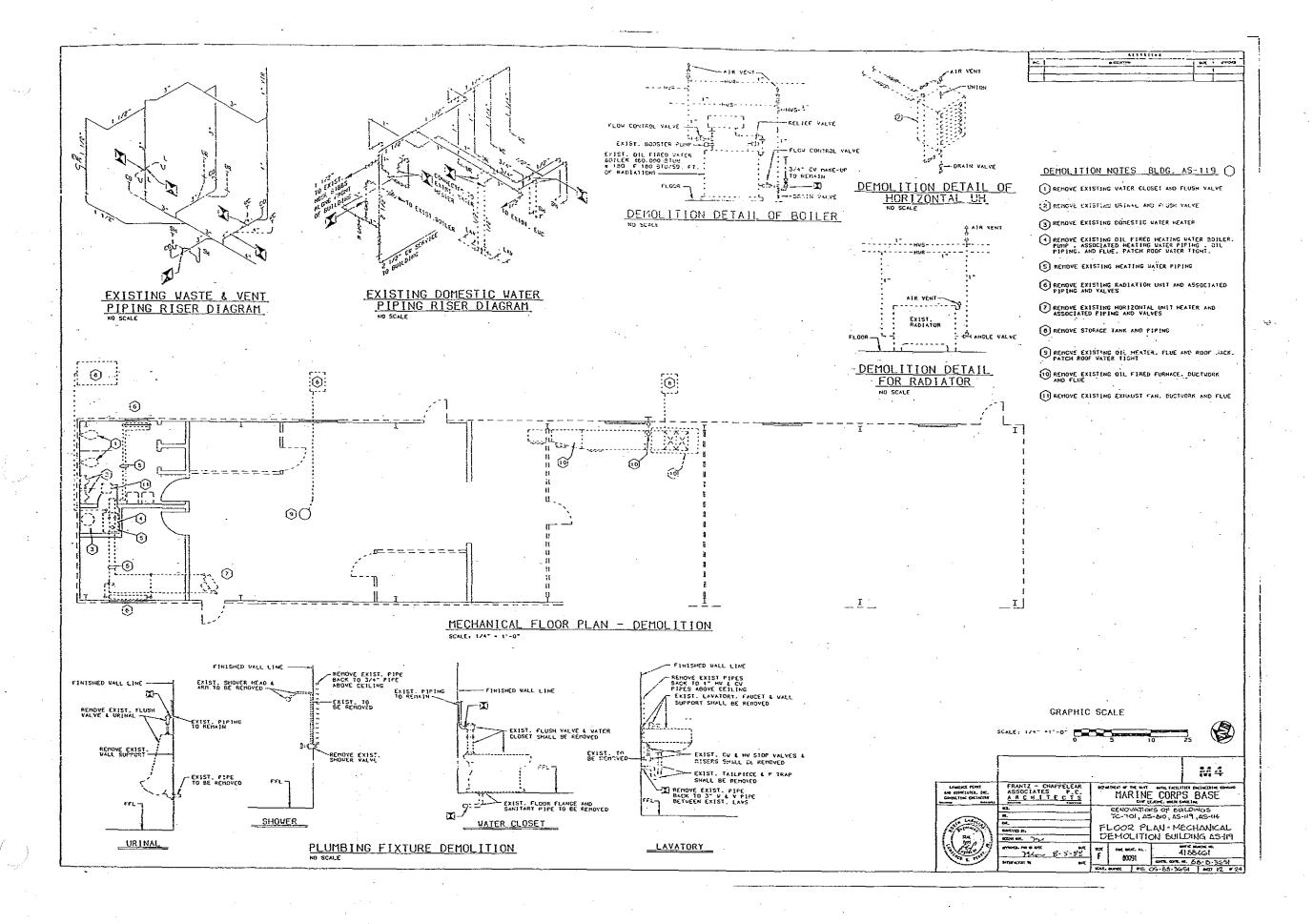
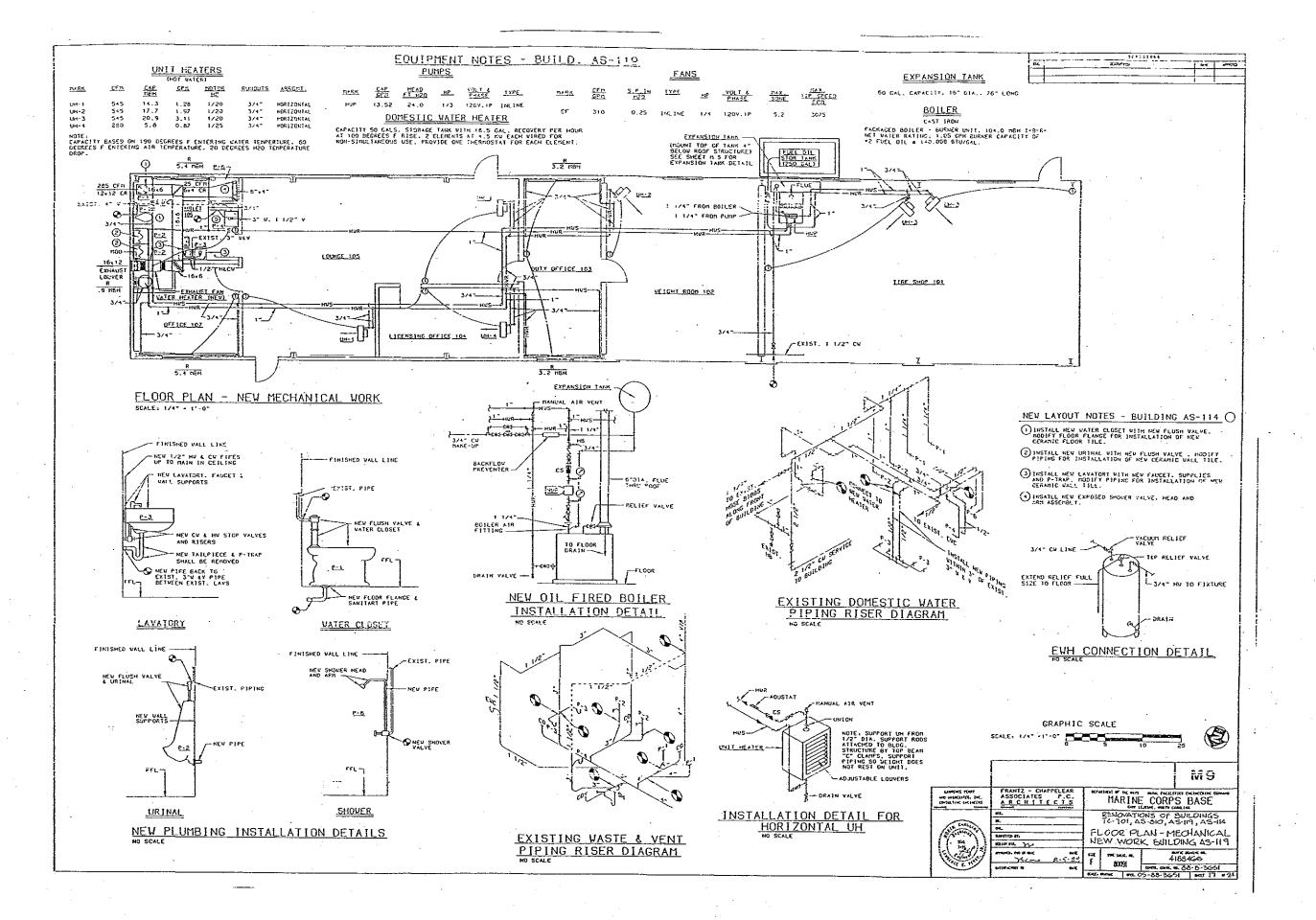


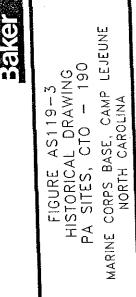
FIGURE AS119-2 HISTORICAL DRAWING PA SITES, CTO - 190

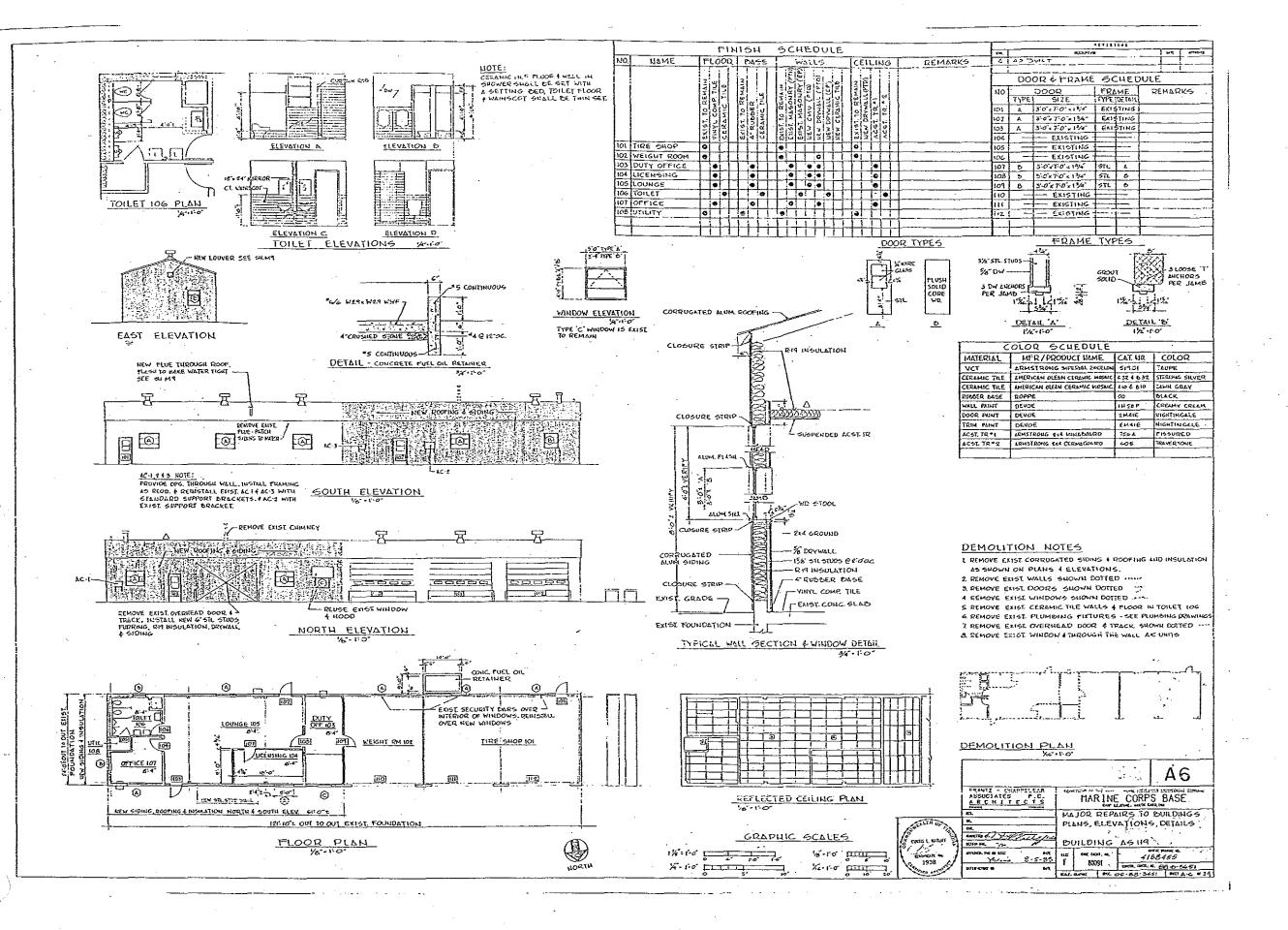
CAMP

BASE, H CAR

CORPS







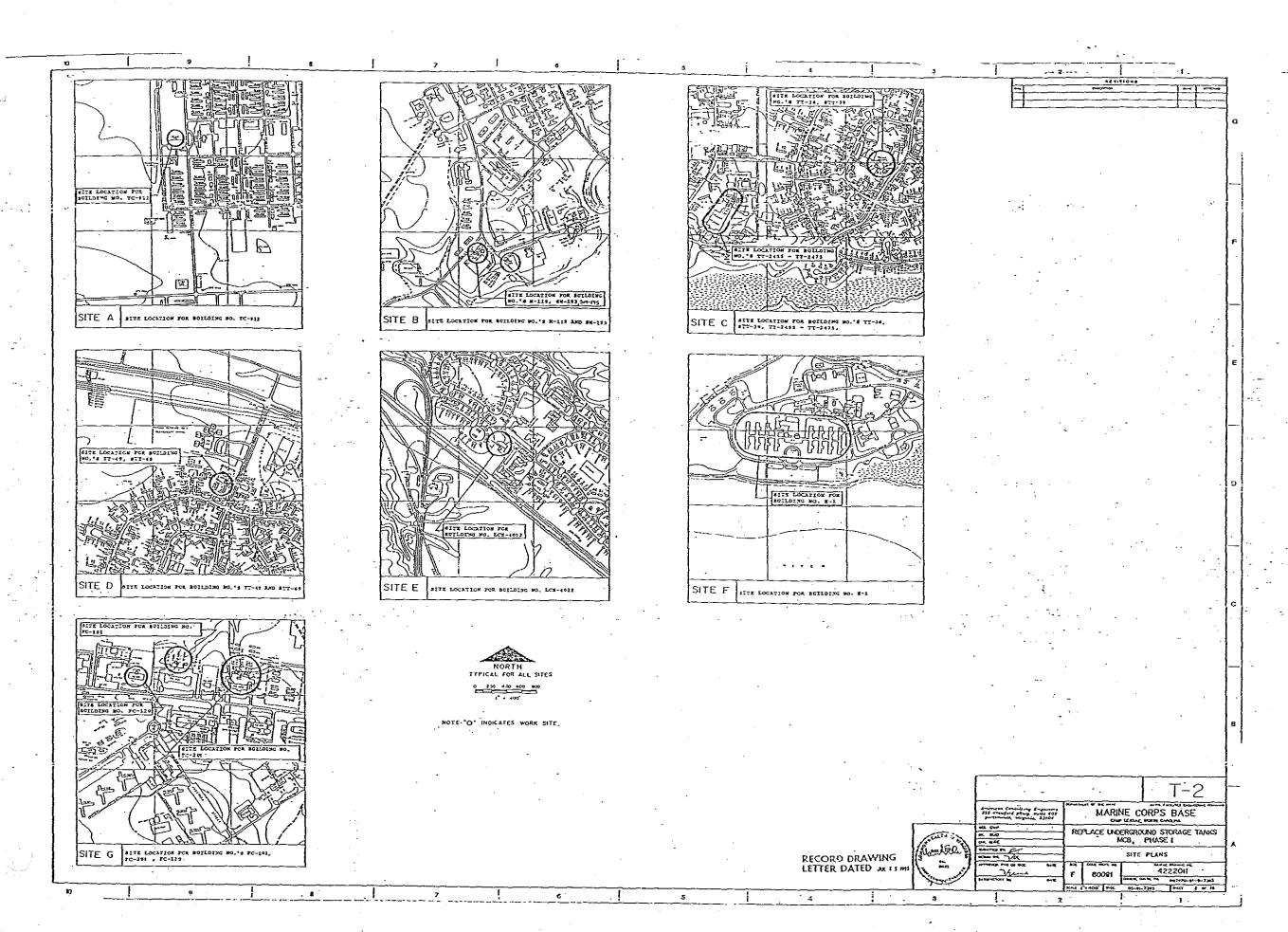


FIGURE M119-1 HISTORICAL DRAWING PA SITES, CTO - 190 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA

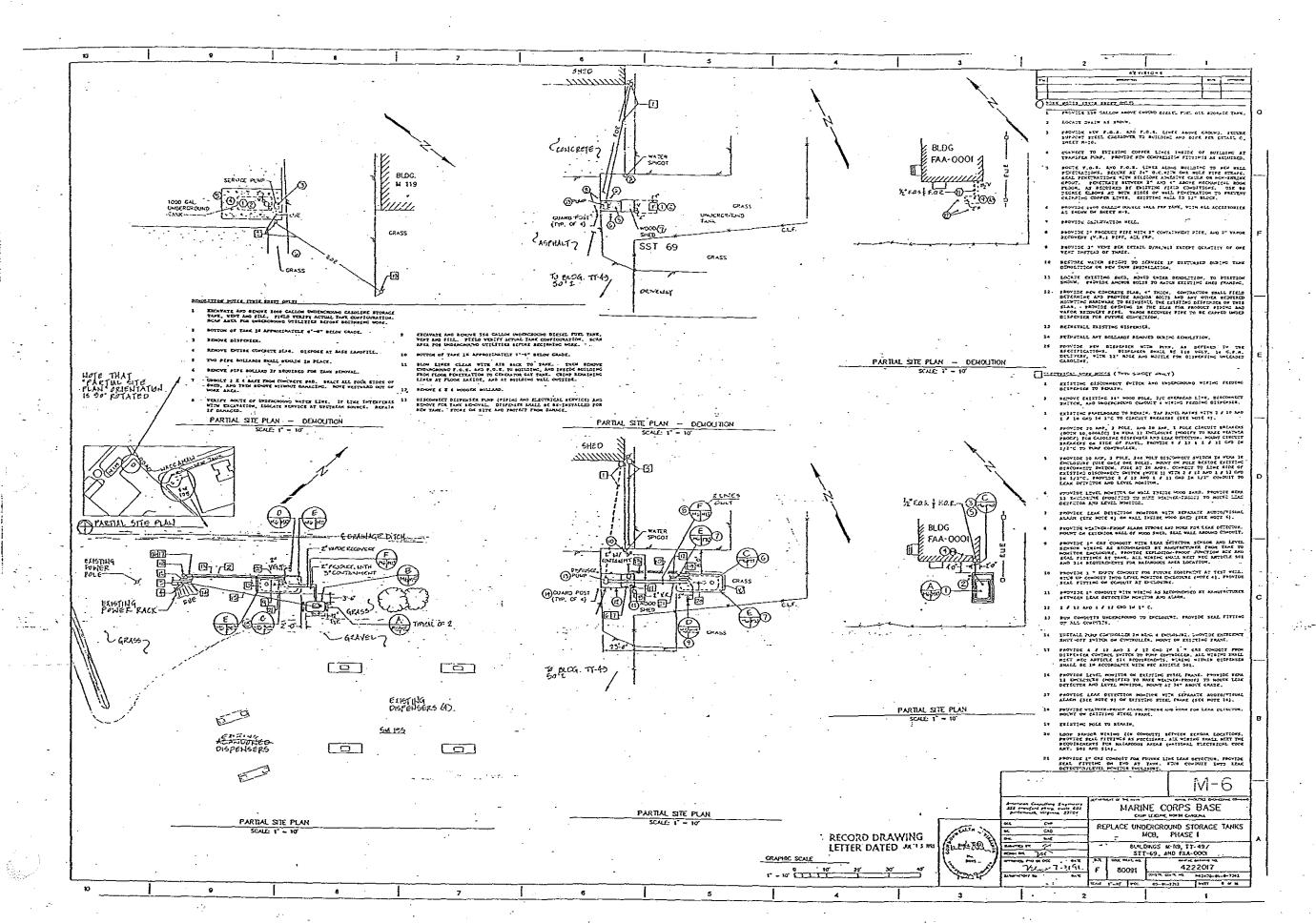
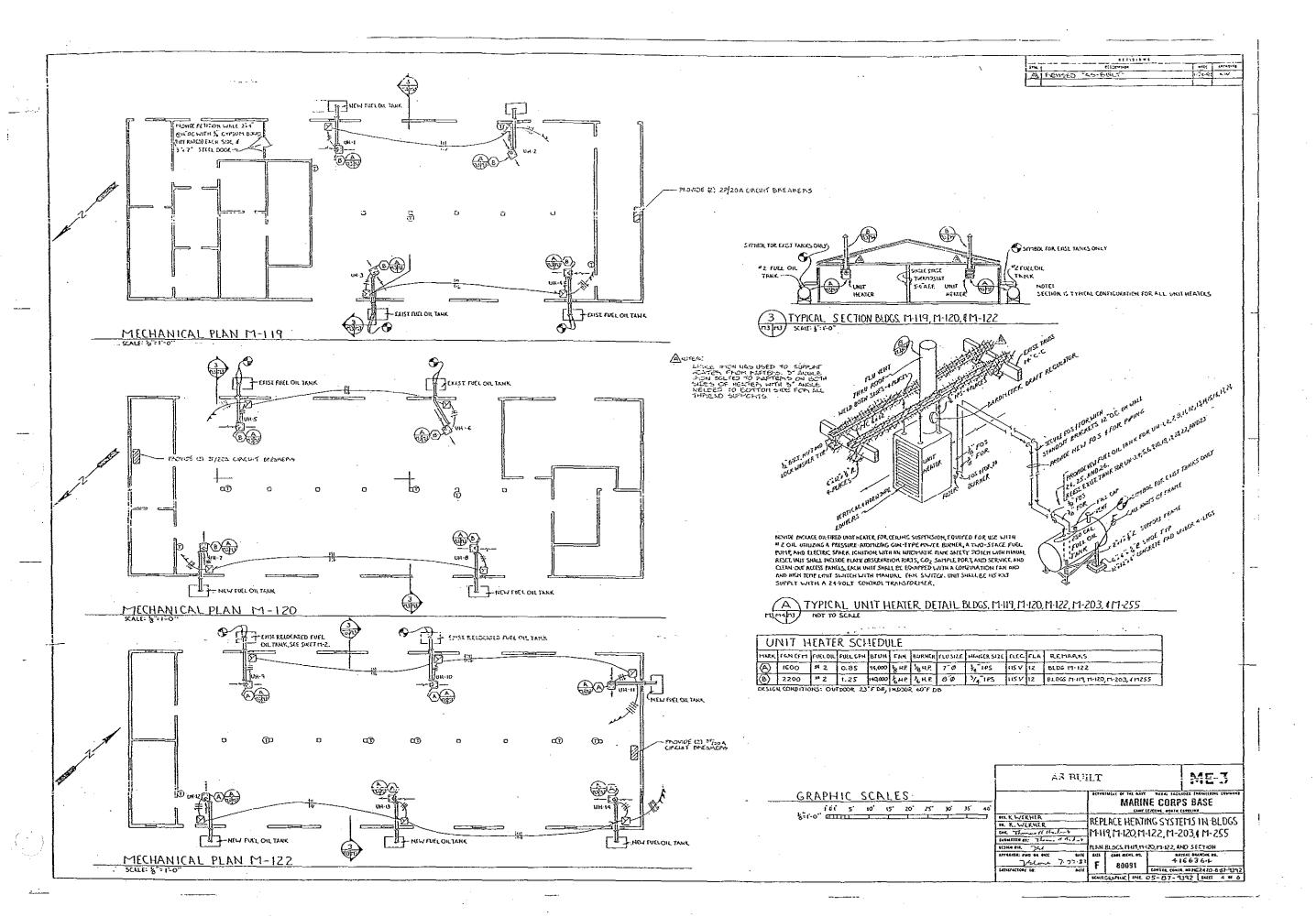


FIGURE M119—2 HISTORICAL DRAWING PA SITES, CTO — 190 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA

Baker

FIGURE M119-3
HISTORICAL DRAWING
PA SITES, CTO - 190
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



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FIGURE M119-4
HISTORICAL DRAWING
PA SITES, CTO - 190
MARINE CORPS BASE, CAMP LEJEUN
NORTH CAROLINA

APPENDIX F
PREVIOUS INVESTIGATION INFORMATION

APPENDIX F.1 HPIA LTM PROGRAM

TABLE 8

SUMMARY OF WATER LEVEL MEASUREMENTS OPERABLE UNIT NO. 1 - SITE 78 MONITORING AND 0&M SUPPORT, CTO-0120 MCB, CAMP LEJEUNE, NORTH CAROLINA

Monitoring	Reference	SWE	SWE	SWL	SWE
Well	Elevation ⁽¹⁾	7/16/00	1/9/01	7/12/01	7/12/01
78-GW01	32.92	NA	NA	NA	NA
78-GW02	32.15	23.81	24.67	NA	NA
78-GW03	31.85	23.50	25.58	NA	NA
78-GW04-1	31.63	10.90	12.48	NA	NA
78-GW05	28.63	17.48	18.59	NA	NA
78-GW06	27.94	12.70	14.75	NA	NA
78-GW07	27.83	13.13	15.04	NA	NA
78-GW08	28.72	14.89	16.50	NA	NA
78-GW09-1	28.13	16.11	17.97	NA	NA
78-GW09-3	26.97	15.29	17.00	NA	NA
78-GW10	28.13	14.89	16.58	NA	NA
78-GW11	28.22	13.85	15.73	NA	NA
78-GW12	30.08	17.57	19.39	NA	NA
78-GW13	26.20	13.67	15.33	NA	NA
78-GW14	27.32	18.47	20.02	NA	NA
78-GW15	27.03	18.34	19.80	3.58	23.45
78-GW16	32.40	19.52	21.47	10.94	21.46
78-GW17-I	30.00	18.76	20.11	10.00	20.00
78-GW19	29.07	19.88	20.58	NA	NA
78-GW20	25.33	16.00	18.53	NA	NA
78-GW21	33.51	23.19	24.34	9.48	24.03
78-GW22A	32.36	23.16	25.54	6.80	25.56
78-GW23	32.08	20.77	23.53	9.24	22.84
78-GW24-1	32.84	23.87	25.69	6.60	26.24
78-GW24-2	33.73	20.05	23.29	11.44	22.29
78-GW24-3	32.32	18.48	21.65	11.65	20.67
78-GW25	32.58	22.37	25.21	7.42	25.16
78-GW33	29.84	22.22	24.19	5.77	24.07
78-GW34	32,66	NA	NA /	5.86	26.80
78-GW35	32.08	NA	NA	12.99	19.09
78-GW36	29.86	16.44	18.27	NA	NA
78-GW39	19.44	3.63	3.94	NA	NA
78-GW40	31.34	19.67	23.71	8.95	22.39
78-GW41	29.54	22.65	24.02	5.53	24.01
78-GW42	28.52	NA	12.30	NA	NA
78-GW43	29.94	NA	23.49	8.45	21.49
78-GW44	30.25	NA	22.41	8.78	21.47
78-GW45	28.67	NA	23.74	6.18	22.49
78-GW46	30.51	NA	22.52	8.49	22.02
78-GW47	29.76	NA	22.33	8.43	21.33
78-GW48	29.21	NA	22.87	6.75	22.46

Notes:

^{(1) =} Top of well casing expressed in feet above mean sea level.

SWL = Static water level taken from top of well casing.

TABLE I

SUMMARY OF WELL CONSTRUCTION DETAILS OPERABLE UNIT NO. 1 - SITE 78 MONITORING AND 0&M SUPPORT, CTO-0120 MCB, CAMP LEJEUNE, NORTH CAROLINA

		Top of PVC							·
		Casing	Ground Surface	Boring	Well	Screen	Depth to	Depth to	Finished
Monitoring	Date	Elevation	Elevation	Depth	Depth	Interval	Sand Pack	Bentonite	Well
Well	Installed	(feet above msl)	(feet above msl)	(feet bgs)	(feet bgs)	(feet bgs)	(feet bgs)	(feet bgs)	Appearance
78-GW01	1986	NA	NA	27.0	25.0	5.0-25.0	3	2	Stick up
78-GW04-1	1986	31.6	28.9	27.0	24.5	4.5-24.5	3	2	Stick up
78-GW05	1986	28.6	26.1	27.0	27.0	5.0 - 25.0	3 .	1	Stick up
78-GW08	1986	28.7	26.3	27.0	25.0	5.0-25.0	3	2	Stick up
78-GW09-1	1987	28.1	NA	27.0	25.0	5.0-25.0	3	2	Flush Mount
78-GW09-3	1986	27.0	24.7	152.0	150.0	130-150	105	10	Flush Mount
78-GW10	1986	28.1	25.7	27.0	25.0	5.0-25.0	3	2	Stick up
78-GW11	1986	28.2	25.5	25.5	25.0	5.0-25.0	3	2	Stick up
78-GW14	1986	27.3	25.0 26.8	25.5 25.5	25.0 25.0	5.0-25.0 5.0-25.0	3	2	Stick up
78-GW15 78-GW17-1	1986 1986	27.0 30.0	27.5	25.5	25.0	5.0-25.0 5.0-25.0	3	2 2	Flush Mount
78-GW17-1	1986	33.5	31.2	25.0	25.0	5.0-25.0	3	2	Stick up Flush Mount
78-GW21	1986	32.4	30.4	25.0	25.0	5.0-25.0	3	2	Flush Mount
78-GW23	1986	32.1	30.0	25.5	25.0	5.0-25.0	3	2	Stick up
78-GW24-1	1986	32.8	30.5	25.5	25.0	5.0-25.0	3	2	Stick up
78-GW24-2	1987	33.7	30.4	80.0	76.6	56.6-76.6	52	49	Stick up
78-GW24-3	1987	32.3	30.5	155.0	148.0	128-148	90	84	Stick up
78-GW25	1986	32.6	30.1	25.5	25.0	5.0-25.0	5	3	Stick up
78-GW39	1993	19.4	16.8	20.0	20.0	10.0-20.0	8	6	Stick up
78-GW40	1998	31.3	NA	24.6	24.6	4.4-24.0	3	1.5	Stick up
78-GW41	1998	29.5	NA	24.5	24.0	4.5-23.8	3	1.5	Flush Mount
78-GW42	1998	28.5	NA:	24.0	23.0	3.9-23.2	3	1.5	Flush Mount
78-GW43	2000	29.9	30,2	30.0	30.0	25.0 - 30.0	25.0	0	Flush Mount
78-GW44	2000	30.3	30.5	32.0	31.2	27.5 - 31.2	25.0	24.5	Flush Mount
78-GW45	2000	28.7	28.9	25.0	25.0	20.0 - 25.0	20.0	0	Flush Mount
78-GW46	2000	30.5	30.7	23.0	23.0	18.0 - 23.0	18.0	0	Flush Mount
78-GW47	2000	29.8	30.1	30.0	30.0	25.0 - 30.0	25.0	- 0	Flush Mount
78-GW48	2000	29.2	29.4	23.0	23.0	18.0 - 23.0	0.81	0	Flush Mount
78-GW49	2001	25.6	25.9	30.5	30.5	25.5 - 30.5	25.0	15	Flush Mount
78-GW50	2001	29.3	29.6	23.0	23.0	18.0 - 23.0	23.0	15	Flush Mount
78-GW51 78-GW52	2001	27.1	27.3 27.6	32.0	24.0 32.0	19.0 - 24.0 27.0 - 32.0	18.0 27.0	15 -25	Flush Mount
78-GW53	2001	27.9	28.1	27.0	27.0	22.0 - 27.0	22.0	20	Flush Mount Flush Mount
78-GW54	2001	29.3	29.7	24.0	24.0	19.0 - 24.0	18.0	16	Flush Mount
78-GW55	2001	29.1	29.4	23.5	23.5	18.5 - 23.5	17.0	15	Flush Mount
78-GW56	2001	29.2	29.5	29.6	29.6	24.6 - 29.6	24.0	22	Flush Mount
78-GW57	2001	29.3	29.6	28.0	28.0	23.0 - 28.0	21.0	19	Flush Mount
78-GW58	2001	NA	NA	28.0	28.0	23.0 - 28.0	21.0	20	Flush Mount
78-GW59	2001	28.1	28.4	25.0	25.0	20.0 - 25.0	20.0	18	Flush Mount
78-RW01									
78-RW02									
78-RW03									
78-RW04									
78-RW05									
78-RW06				ļ	<u></u>	l	<u> </u>		
78-RW07				IT TO PRO	VIDE THIS	DATA IF POSS	IBLE		
78-RW08			 	 					<u> </u>
78-RW09	ļ		 	<u> </u>	<u> </u>				
78-RW10	ļ	 	ļ	ļ	<u> </u>		<u></u>		ļ
78-RW11	 	 	ļ	<u> </u>	 _		<u> </u>		ļ
78-RW12	 	 	ļ	ļ	.		<u> </u>	 -	
78-RW13								 	1
78-RW14		· · ·		<u> </u>		<u> </u>	 		
78-RW15	L	<u> </u>			<u> </u>	L		<u> </u>	

Notes:

msi

= Mean sea level

bgs

= Below ground surface

NA

= Not Available

SITE 78 SAMPLE HISTORY Last Updated

	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	010
78-GW01		1			J		· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·							·	
1.1.1-Trichloroethane	ND	ND	ND	ND	ND.	ND	ND	ND	ND	ND	ND	NS	ND	ИN	NS	
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	1,2 J	ND	ND	ND	ND	ND	NS	ND	· ND	NS	
1,1-Dichloroethene	0.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND -	NS	ND	ND	NS	
Acetone	ND	ND	4	3	ND	ИD	ND	ND	. ND	ND	ND	. NS	ND	ND	NS	
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Bromoform	ND	ND	ND	ND	ND	0.68 J	ND	ND	ND	ND	ND	NS	ИD	. 6	NS	
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	4 J	ND	4 J	5	NS .	3 J	ИD	NS	1
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Methylene chloride	ND	ND	ND	ND	ND	1.5 JB	3 JB	ŅD	ND	ND	ND	NS	ND	ND	NS	
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND _	ND	NS	ND	ND	NS	
Toluene	ND	0,8	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	NĐ	ND	ND	ND	NS	ND	ND	NS	
Trichloroethene	60	21	12	18	21	14	35	7	5	11	6	NS	17	25	NS	ļ
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	1 J	2	NS	ND	ND	NS	1
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Lead	ND	ND	ND	ND	ND	NĐ	ND	ND	ND	ND _	ND	NS	ND	ND	NS	
Total 1,2-Dichloroethene	18	5	3	4	10	3.9 J	7.9	NA	ИD	4J	5	NS	3J	6	NS	
78-GW04																
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND .	ND	ND	ND	ND .	NS	ND	ND	NS	
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	' NS	<u> </u>
1,2-Dichloroethene (total)	ND	ND	2	2	1	ND	.92 J	NR	ND	6	ND	NS	3J	ND	NS	
Acetone	ND	ND	ND	ND	ND	ND	ИD	ND	ND	ND	ND	NS	ND	ND	NS	<u> </u>
Benzene	ND	ИD	ND	ND	ND_	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Chloride	ND	ND	ND	DИ	ND	ND	ND	ND	ND	ND _	10	NS	ND	ND	NS	
Chlorobenzene	ND	ИD	ND	ND	ND	0.87 J	0.86 J	ND	ND	ND	ND	NS	ND	ND	NS	
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	3 J	ND	6	ND	NS	3 J	ND	NS	
Ethylbenzene	ND	ND	ND	ND	ND	ИD	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Methylene chloride	ND	ND	ND	ND	ND	1.4 3	1.6 JB	ND	ND	ND	ND	NS	ND	ND	NS	
Tetrachloroethene	ND	ИD	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Toluene	ND	ND	ND	ND	ND	ND	ND .	ND	ND	ND	ND	NS	ND	ND	NS	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Trichloroethene	2	4	8	7	6	2.9 J	ND	6	4 J	11	4 Ј	NS	9	ND	NS	
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Lead	2.7	3.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND.	ND	NS	

SITE 78 SAMPLE HISTORY
Last Updated

	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	G00	01A	01B	01C	C10
78-GW05																
1,1,2-Trichloro-1,2,2-Trifluor	ND	ND	NS	l NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
1,1,2,2-Tetrachloroethane	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
1,1-Dichloroethene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
1,2-Dichloroethane	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
Benzene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
cis-1,2-Dichloroethene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
Ethylbenzene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
Methylene chloride	NĐ	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
Tetrachloroethene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
Toluene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
trans-1,2-Dichloroethene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	<u></u>
Trichloroethene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
Vinyl chloride	ND	ND	NS	NS.	NS	NS	NS	NS	NS	NS	NS	NS_	ND	ND	NS	
Xylenes	ND	ND	NS	NS	NS	NS	NS	NS	NS _	NS	NS	NS_	ND	ND	NS	
Lead	ND	1.7	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
1,2-Dichloroethene (total)	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ND	ND	NS	
78-GW08																
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	· ND	ND	NS	
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND .	ND	ND	ND	NS	ND	ND	· NS	
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	NĐ	5.7	NA	ND	ND	ND	NS	ND	ND	NS	T
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ИD	NS	
Benzene .	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
cis-1,2-Dichloroethene	ND	ND	ND	ND.	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	7
Methylene chloride	ND	ND	ND	ND	ND	1.6 J	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Toluene	ND	ND	_ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ИD	ND.	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Trichloroethene	ND	ND	ND	ND	ND	ND	57	ND	ND	ND	ND	NS	ND	ND	NS	
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	. ND	ND	· ND	NS	ND	ND	NS	T
Lead	1.5	ND	ND	ND	ΝD	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	

SITE 78 SAMPLE HISTORY Last Updated

	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	01D
78-GW09	700	1 702	1 2/6	1		7011			L					<u>×1</u>		Name of the last o
1.1.1-Trichtoroethane	420	360	500	480	370	340	ND	230	190 D	130	. 120	NS	62	67	NS	
1.1.2.2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	۸D	NS	DОИ	ND	NS	
1.1-Dichloroethene	140	36	78	140	91	16	ND	52	40	33	28	NS	12	18	NS	
1.1-Dichloroethane	52	45	50	67	68	28	ND	50	37	25	24	NS	11	15	NS	
1.2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	NĎ	ND	ND	NS	ND	ND	NS	
1.2-Dichloroethene (total)	620	170	220	300	570	91	DN	NA	71	46	37	NS	18	23_	NS	
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	N'D	NS	ND	ND	NS	
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	.ND	NS	
Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	. 10	NS	ND	ND	NS	
Chloroform	4	2	ND	2	2	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND.	38	71	46	37	NS	18	23	NS	
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Methylene chloride	ND	ND	ND	ND	ND	3,7 JB	1.4 JB	ND	ND	ND	ND	NS	ND	ND	NS	
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Toluene	ND	NĎ	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ИĎ	ND	NS	ND	ND	NS	
Trichloroethene	1000	490	640	580	920	360	ND	130	240	200	180 D	· NS	140	170	NS	
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Xylenes	ND	ND	ND	ND	ND	ND	. ND	ND	ND	ND ·	ND	NS	ND	ND	NS	1
Lead	16.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
78-GW09DW														,		
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND ·	NS	T
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND:	ND	NS	1
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	1
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND.	ND	ND	ND	ND	NS ,	ND	ND	NS	
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	NS	, ND	ND	NS	
Acetone	ND	ND.	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	N'S	
Benzene .	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	· NS	Ī
cis-1,2-Dichloroethene	ND	_ DN	ND	שא	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Methylene chloride	ND	ND	ND	ND	ND	1.5 J	ND	ND	ND.	ND	ND	NS	ND	ND	NS	
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Toluene	ND	ND	ND	ИD	ND	· ND	, ND	ND	ND	ND	ДИ	NS	ND	ND	NS	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	.∙ ND	ND	NS	ND	ND	NS	
Trichloroethene	ND	ND	ДИ	ND	ND	ND	ND	ND	ND	ND_	ND	NS	ND	ND	NS	
Vinyl chloride	ND	ND	ND	ДN	ND	ND	ИD	ND	ND	ND	ND	NS	ND	ND	NS	
Xylenes	ND	ND	ND	ND	ДИ	מא	ND	ND	ND	ND	ИD	NS	ND	ND	NS	
Lead	4.6	ND	ND	_ND_	ND	ND	ND	ND	ND	ND	ND	NS	ND .	ND	NS	

SITE 78 SAMPLE HISTORY Last Updated

	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	OID
78-GW09IW	<u> </u>	·		·			L	·		·	····	· · · · · · · · · · · · · · · · · · ·	·			
1.1.1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	NE	NE	NE	NE	NE	NE	NE	
1.1.2.2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	NE	NE	NE	NE	NE	NE	NE	1
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ИD	ND	NE	NE	NE	NE	NE	NE	NE	
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	NE	NE	NE	NE	NE	NE .	NE	
1,2-Dichloroethene (total)	2	2	4	3	5_	4,3 J	1.5 J	N.A	NE	NE	NE	NE	NE	NE	NE	
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	NE	NE	NE	NE	NE	NE	NE	
Benzene	ND	ND	ND	ИD	ND	ND	ND	ND	NE	NE	NE	NE	NE	NE	NE	· .
Chlorotorm	ND	ND	ND	ND	ND	ND	ND	ND	NE	NE	NE	NE	NE	NE	NE	
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ДИ	ND	NE	NE	NE	NE	NE	NE	NE	
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	NE	NE	NE	NE	NE	NE	NE	
Methylene chloride	ND	ND	ND	ND	ND	1.5 J	5,5 B	ND	NE	NE	NE	NE	NE	NE	NE	
Tetrachloroethene	ND	ND	ND	ND	מא	ND	ND	ND	NE	NE	NE	NE	NE	NE	NE	
Toluene	ND	ND	ND	ND	ND	ND	0.7 J	ND	NE	NE	NE	NE	NE	NE	NE	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	NE	NE _	NE	NE	NE	NE.	NE	
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	NE	NE	NE	NE	NE	NE	NE	
Vinyl chloride	ND	ND	ИD	ND	ND	ND	ND	ND	NE	NE	NE	NE	NE	NE	NE	
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	_NE	NE	NE	NE	NE	NE	NE	
Lead	2.2	· 2.5	ND	ND	ND	ND	ND	ND	NE	NE	NE	NE	NE	_NE	NE	
78-GW10																
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND.	·ND	ND	NS	ND	ND	NS	
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	מא	ND	NS	
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	. ND	ND	ND	ND .	NS	ND	ND	NS	1
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND ·	ND	5.4	NA	ND	ND.	ND	NS	ND	ND	NS	1
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Benzene .	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS .	ИD	ND	NS	
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	<u> </u>
Methylene chloride	ND	ND	ND	ND	ND	1.3 JB	ND	ND	ND	ND	ND	NS	ИD	ND	NS	
Tetrachloroethene	ND_	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Toluene	ND	ND	ND	ND	ND	ND	0.66 J	.ND	ND	ND	ND	NS	ND	ND	NS	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	מא	ND .	NS	
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	<u> </u>
Vinyl chloride	ND	ND	ND_	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND.	NS	ND	ND	NS	
Lead	ND	4.1	ND	ND	ND	ND.	ND	ND	ND	ND	ND	NS	ND	ND	NS	1

İ	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	010
78-GW11				***************************************												
1.1.1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
1.1.2.2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
1.1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
1.2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	NA	ДŊ	ND	ND	NS	ND	ND	NS	
Acetone	ND	ND	ND	. ND	ND	_ND	ND	ND_	ND	ND	ND	NS	ND	ND	NS	
Benzene	ND	ND.	ND	ND	ND	ND	ND	ND	_ ND	ND	ND	NS	ND	ND	NS	
cis-1,2-Dichtoroethene	ND	ND	ND	ND	ND	_ND _	ND	ND	ND	ND	ND	NS	ИD	ND	NS	
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	<u> </u>
Methylene chloride	ND	ND	ND	ND	ND	1.6 JB	ND	ND	ND	ND	ND	NS	ND	ND	NS	ļ
Tetrachloroethene	ДN	ND	ND	ND	ND	ИD	ND	ND	ND	ND	ND	NS	ND	ND	NS	<u> </u>
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Trichloroethene	ND	ND	ND	ИD	ND	ND	D N	ND	ND	ND	ND	NS	ND	ND	NS	
Vinyl chloride	ND	ND	ND	ND	ND	. ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Xylenes	ND	ND	ND	ND	ND	ND	ND	DND	ND	ND	ND	NS	ND	ND	NS	
Lead	ND	ND	ND	ND	ND	ND	ND	ND	ND	מא	ND	NS	ND	ND	NS	}
78-GW14																
1,1,2-Trichloro-1,2,2-Trifluor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	· NS	
1,1,2,2-Tetrachloroethane	ИD	ND	ND	ND	ND	ND	ND	, ND	ND	ND	ND	NS	NS	NS	NS	
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
1,2-Dichloroethane	ND	ND.	ND	ND	ND	ND	ND _	_ND _	ND	ND	ND	NS	NS	NS	NS	
1,2-Dichloroethene (total)	ND	ND_	ND	МD	ND	ND	ND	NA	ND	· ND	ND	NS	NS	NS	NS	
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
Benzene	ND	ND	DN	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
cis-1,2-Dichloroethene	ND	ND	סא	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
Ethylbenzene	מא	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	Ţ
Methylene chloride	ND	מא	ND	ND	ND	1.6 J	ND	ND	ND	ND	ND	NS	NS	NS	NS	
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	מא	ND	NS	NS	NS	NS	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND .	ND	ND ·	ND	ND	ND	ND	NS	NS	NS	NS	
Trichloroethene	. ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
Vinyl chloride	ND	ИD	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
_Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND,	NS	NS	NS	NS	
Lend	2.5	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	

SITE 78 SAMPLE HISTORY

Last Updated

	96C	96D	97A	97B	97C	98A	98C	. 99A	99C	00A	00C	00D	01A	01B	01C	010
78-GW15	1 700	J 20D	1 2/14	770	, ,,,,	70A	700	. 227	, ,,,	<u>~~13</u>	, 000	1 000	<u>~~~</u>		L	Post of the last o
1.1.1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	ND	NS	
1.1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	ND	NS	
1.1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	ND	NS	ļ
1.1-Dichloroethane	ND	ND	ND	ND	ND	ND	ИD	ND	ND	ND	ND	NS	NS	ND	NS	
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	ND	NS	
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	ND	NS	
Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	NS	NS	ND .	NS	
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	ND	NS	1
cis-1.2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	88	NS	
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	DИ	ND	ND	ND	NS	NS	ND	NS	
Methylene chloride	ND	ND	ND	ND	ND	1.6 JB	3.8 JB	ND	ND	ND	ND	NS	NS	ND	NS	i
Tetrachtoroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	ND	NS	
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	ND	NS	
trans-1.2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	ND	NS	
Trichloroethene	ND	0.9	i	1	1	1.1 J	ND	ND	ND	ND	ND	NS	NS	ND	NS	† -
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	ij	NS	1
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	ND	NS	1
Lead .	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	- NS	ND	NS	
Total 1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	· ND	NS	NS	88	NS	
78-GW17			·		·			·		·				·	·	
1.1.1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
I,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND.	ND	NS	NS	NS	NS	1
1, I-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND,	ND	ND	NS	NS	NS	NS	
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
Benzene	ND	ND	ND	ND ·	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
cis-I,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
Methylene chloride	ND	ND	ND	ND	0.5	1.5 J	1.2 J	ND	ND	ND	ND	NS	NS	NS	NS	
Tetrachloroethene	ND	ND	NĎ	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	1
Toluene	ND	ND	ND	ND	МD	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	·
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	NĐ	ND	ND	NS	NS	NS	NS.	
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	[
Lead	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	1
Total 1.2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	NS	NS .	NS	NS	i

	96C	96D	97A	97B	97C	98A	98C	. 99A	99C	00A	00C	00D	01A	01B	01C	010
8-GW19									· · · · · · · · · · · · · · · · · · ·				,	·	, <u> </u>	
1,1,1-Trichloroethane	ND	ND	NS	NS	NS	NS_	NS	NS	NS	NS	NS	NS	NS	NS	NS	ļ
1,1,2,2-Tetrachloroethane	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ļ
1,1-Dichloroethene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
1,2-Dichloroethane	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ļ. <u></u>
1,2-Dichloroethene (total)	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	↓
Acetone	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	ļ
Benzene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<u> </u>
cis-1,2-Dichloroethene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
Ethylbenzene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	<u> </u>
Methylene chloride	ND_	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS_	NS	<u> </u>
Tetrachloroethene	0.8	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1
Toluene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	
trans-1,2-Dichloroethene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS_	NS	NS	NS	
Trichloroethene	ND	0.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	Ϊ
Vinyl chloride	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	T
Xylenes	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	T
Lead	4.3	2.4	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	†
3-GW21		· · · · · · · · · · · · · · · · · · ·			·	·		-					<u> </u>	J		
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	Ţ
1,1,2,2-Tetrachioroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	T
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	1
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	1
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	· NS	NS	NS	NS	1
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	· NS	NS	NS	NS	
Benzene	ND	ND	ND	ND	ND .	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND.	NS	NS	NS	NS	
Ethylbenzene	ND	ND	ND	ND	ND .	ND	ND	ND	ND	ND	ND	NS	· NS	NS	NS	
Methylene chloride	ND	ND	ND	DN	ND	1.6 JB	2.9 JB	ND	ND	ИD	ND	NS	NS	NS	NS	
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	0.9 J	ND	ND	ND	NS	NS	NS	NS	1
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	T
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND .	NS	NS	NS	NS	
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	T-
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	1
Lead	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	

	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	0119
78-GW22	<u> </u>		<u> </u>													
1.1.1-Trich!oroethane	ND	ND	ND	ND	[ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	[]
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	Í
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	. ND	ND.	ND	ND	NS	ND	NS	ND	
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	NS	ND	NS	ND	
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Benzene	ND	8500	ND	ND	0.8	ND	ND	ND	ND	16	ND	NS	ND	NS	ND	(
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND ·	ND	ND	ND	. ND	NS	ND	NS	ND	I
Ethylbenzene	ND	2000	ND	ND	ND	ND	ND	ND		9	ND	NS	ND	NS	ND	1
Methylene chloride	ND	ND	ND	ND	ND	1.6 JB	3 JB	ND	ND_	ND	ND	NS	ND	NS	ND	<u> </u>
Tetrachloroethene	ND	ND	ND	ND	ND	0.95 J	ND	ND	ND	ND	ND	NS	ND	NS	ND	<u> </u>
Toluene	ND	18000	ND	ND	0.6	ND	ND	ND	ND	4 J	ND	NS	ND	NS	ND	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ИD	NS	ND	·
Trichloroethene	ND	ND	ND	ND	ND .	ND	ND	ND	ND	21	ND	NS_	ND	NS	ND	
Vinyl chloride	ND	ND	ND	ND	. ND	ND	ND	ND	ND	490 D	ND	NS	ND	NS	ND	
Xylenes	ND	10000	ND	ND	ND	ND_	ND	ND	ND	56	ND	NS_	ND	NS	מא	
Lead	ND	53,5	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	Ī
78-GW23																
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	DM	ND	ND	ND	ND	ND	ND	ND	NS	ND	[
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	
1,1-Dichloroethene	5	_ 2	4	ND	4	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	
1,2-Dichloroethene (total)	8900	6200	7900	9500	10000	11000	8400	NA	6200D	8300D	8100D	9600D	2800	NS	5000	
Acetone	ND	ND	ND	ND	ND	ND	ND	11	61	ND	ND	17	ND	NS	ND	F
Benzene	17	16	16	ND	17	ND	18 J	18	16	16	14	ДN	14	NS	11	
Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	40	ND	ND	NS	מא	
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	7000	6200	8100 D	7900 D	9400 D	4500 D	NS	5000	Γ
Ethylbenzene	9	7	7	ND	7	ND	9.7 J	8	10	9	8	8	5	NS	8	
Methylene chloride	ND	ND	ND	ND	ND	ND	140 JBD	ND	ND	ND	ND	ND	3 J	NS	ND	
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	
Toluene	4	3	3	ND	4	ND	9.4 J	4 J	4 J	4 J	4 J	4 J	ND	NS	3 J	
trans-1,2-Dichloroethene	ND	ND	ND	ND	DM	ND	ND	140	140	140	99	130	92	NS	55 .	
Trichloroethene	50	40	57	עא	62	ND	ND	17	21	21	13	16	14	NS	6	
Vinyl chloride	240	200	360	340	590	560 J	430 JD	360 J	380	490 D	470 D	480 D	190	NS	500	l
Хуlепеs	57	51	46	ND	50	ND	61	57	68	56	69	74	51 .	NS	46	
Lead	3.2	2,4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND .	NS	ND	

	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	010
78-GW24	, ,,,,	1 200	1 7/12		,,,	1	, ,,,,							<u> </u>		
1.1.1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	·ND	ND	NS	ND	
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS .	ND.	
1,1-Dichloroethene	1	ND	ND	ND	0.7	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	
1,2-Dichloroethene (total)	310	120	120	130	220	94	330	NA	830D	200	260D	350D.	160	NS	780	
Acetone	ND	ND	ND	ND	ND	_ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	
Веплене	0.6	ND	ND ·	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	
Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	20	ND	ND	NS	ND	
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	360	810	190	260 D	340 D	150	NS	750	
Ethylbenzene	ND	ND	ND	ND	ДŊ	ИD	ND	ND	ND	ND	ND	ND	ND	NS	ND	
Methylene chloride	ND	ND	ND	ND	ND	3.1 JB	4.7 JBD	30	ND	ND	ND	ND	ND	NS	ND_	
Tetrachloroethene	ND	ND	ND_	ND	ND	ND	ND	ND	ND	ND	ND	ND .	ND,	NS	ND	
Toluene	0.7	ND	ND_	ND	ND	ND	1.5 JD	4 J	4 J	ND	ND	ND	ND	NS	ND	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	18	2.5	10	13	14	- 8	NS	10	
Trichloroethene	45	20	19	_17	28	12	ND	14	13	10	14	16	15	NS	20	
Vinyl chloride	10	6	ND	4	7	ND	5.7 JD	25	31	8	11	10	7	NS	ND	
Xylenes	ND	ND	ND_	ND	ND	DN	ND	ND	ND	ND	ND	ND	DИ	NS	ND	
Lead	ND	ND	מא	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	
78-GW24DW																
1,1,1-Trichloroethane	ND	ND	ND	ND	ИĎ	ND	ND	ND	ND	NĎ	ND	NS	ND	NS	ND	·
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ИD	NS	ND	NS	ND	
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	'ND	NA	ND	ND	ND	NS	ND	NS	ND	
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	N8	ND _	
Benzene	ND	ND .	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
cis-1,2-Dichloroethene	ND	ND	DND	ND	שע	ND	ND_	ND	ND	ND	ND	NS	ND	NS	ND	
Ethylbenzene .	ND.	ND .	ND	ND	ND	ND	ND	מא	ND	ND	ND	NS	ND	NS	ND _	
Methylene chloride	ND	ND	ND	ND	ND	1.5 JB	2.5 J	ND	ND	ND	ND	NS	ND	NS	ND _	
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	9	ND	ND	ND	NS	ND	NS	ND	
Toluene	ND	0.8	ND	ND	ND	ИD	ND_	ND	ND	ND	ИD	NS	ND	NS	ND	
trans-1,2-Dichloroethene	ND	ND	ND	ND	ДИ	ND	ND	ND	ND	ND	ND	NS	ND	NS	NĐ	
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Xylenes	ND	ИD	ND	ND	ND	ND	ND	ND	ND	ND .	ND	NS	ND	NS	ND	
Lead	3.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND ,	NS	ND	

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	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	610
78-GW24IW	, ,,,	1			,	, , , , , ,	,		•		·	·····	·	· · · · · · · · · · · · · · · · · · ·	·	1
1.1.1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1.1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1.2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	NS	ND	NS	ND	
Acetone	ND	ND	ND	ND	DИ	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	I
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	Ţ
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND.	ND	ND.	ND	ND	NS	ND	NS	ND	I
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	T
Ethylbenzene	ND	ND	ND	ND	ND.	ND	ND	ND_	ND	ND	שא	NS	ND	NS	ND)
Methylene chloride	ND	ND	ND	ND	ND	1.6 JB	2.4 J	ND	ND	ND	ND	NS	ND	NS	ND	I
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	Ţ
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	T
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	1
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	T
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	1
Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	Ī
Lead	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	T
78-GW25																
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	T
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	Ţ
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	1
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	T
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	NS	ND	NS	ND	1
Acetone	ИD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	1
Benzene	ND	ND	ND	ИD	ND	ND	ND	ND	ИD	ND	ND	NS	ND	NS	ND	T
Chloride	ND	ND	_ ND	ND	ND	ND	_ DD	ND	ND	ND	50	NS	ND	NS	ND	
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	N.S	ND	T
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	. ND	ND	ND	ND	NS	ND	NS	ND	1
Methylene chloride	ND	ND	ND	ND	ND	ND	2.5 JB	ND	ND	ND	ND	NS	ND	NS	ND	
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	- ND	T .
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	1
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND .	NS	ND	1
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Xylenes .	ND	ND	ND	ДИ	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	1
Lead	ND	3.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	

	96C	96D	97A	97B	97C	. 98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	010
78-31DW									,	v						
1,1,1-Trichloroethane	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	· NS	
1,1,2,2-Tetrachloroethane	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	
1,1-Dichloroethene	ND	ND	NS	NS	NS	NS	NS_	NS	NS.	NS	NS	NS	NS	NA	NS	
1,2-Dichloroethane	ИD	ND	NS	NS_	NS	NS	NS	NS	NS	NS NS	NS	NS	NS	NA	NS	
1,2-Dichloroethene (total)	ND	ND	NS	NS	NS	NS	NS_	NS	NS	NS	NS	NS	NS	NA	NS	
Асетопе	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	<u> </u>
Benzene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	<u> </u>
cis-1,2-Dichloroethene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	
Ethylbenzene	ND	ND	NS	NS_	NS.	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	
Methylene chloride	ND.	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	<u> </u>
Tetrachloroethene	ND	ND	NS	NS	NS .	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	<u> </u>
Toluene	ND	, ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	
trans-1,2-Dichloroethene	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	<u> </u>
Trichloroethene	ND	ND	NS	NS	NS	NS	NS	_NS_	NS	NS	NS	NS	NS	NA	NS	
Vinyl chloride	ND	ND	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	
Xylenes	ND	_ מא	NS	NS	NS	NS	NS	N\$	NS	NS	NS	NS	NS	NA	NS	
Lead	2	20.8	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NS	
78-GW39							•									
1,1,1-Trichloroethane	ND	ND	ND	ND	_ND_	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
I,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ИD	ND	ND	ND	ND	ND	NS	N.D	ND	NS	
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ИD	ND	NS	
1,2-Dichloroethane	ND	ND_	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
1,2-Dichloroethene (total)	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	NS	ND	ND	NS	
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	. ND	ND	ND	NS	ND	ND	NS	
Веплеле	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Ethylbenzene	ND	ND_	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Methylene chloride	ND	1	ND	ND	ND	1.7 JB	2.6 J	ND	ND	ND	ND	NS	ND	ND	NS	
Tetrachloroethene	11	ND_	0.7	8.0	0.7	1.4 J	ND	ND	ND	ND	ИD	NS	ND	ND	NS	<u> </u>
Toluene	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
trans-1,2-Dichloroethenc	ND	ND	ND	ND	ND	UN	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND .	ND	NS	
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	
Xylenes	0.7	ND	ND	ND	ΔN	ND	ND	ND	ND	ND	ND	NS	ND	ND	NS	1
Lead	ND	1.3	ND	ND	ND	ND	ИD	ND	ND	ND	ND	NS	ND	. ND	NS	

	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	0110
78-GW40 .				1	l <u> </u>	<u> </u>							· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		100000000000000000000000000000000000000
1,1,1-Trichloroethane	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,1,2,2-Tetrachloroethane	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,1-Dichloroethene	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,2-Dichloroethane	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	<u> </u>
1,2-Dichloroethene (total)	NE	NE	NE	NE	NE	ND	2 J	NA	ND	ND	ND	N8	ND	NS	ND	<u> </u>
Acetone	NE	NE	NE	NE	NE:	ND	ND	ND	ND	ND	ND	NS	ND	NS	ДN	
Benzene	NE	NE	NE	NE	NE	ND	ND	ИD	ND	ND	ND	NS	ND	NS	ND	
Chloride	NE	NE	NE	NE	NE	ND	ND	ND .	ND	ND	20	NS	ND	NS	ND	<u> </u>
cis-1,2-Dichloroethene	NE	NE	NE	NE	NE	ND_	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Ethylbenzene	NE_	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	<u> </u>
Methylene chloride	NE	NE	NE	NE	NE	1.7 JB	3.4 JB	ND	ND	ND	ND	NS	ND	NS	ND	
Tetrachloroethene	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	1
Toluene	NE	NE	NE	NE	NE	ND_	ND	ND	ND	ND	ND	NS	ND	NS	ND	
trans-1,2-Dichloroethene	NE_	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Trichloroethene	NE	NE	NE	NE	NE	ND	25	ND	ND	ND	ND	NS	ND	NS	ND	
Vinyl chloride	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	1
Xylenes	NE	NE	NE	NE	NE	0.79 J	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Lead	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
78-GW41																
1,1,1-Trichloroethane	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,1,2,2-Tetrachloroethane	NE _	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,1,2-Trichloroethane	NE	NE_	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	}
1.2-Dichloroethane	NE	NE_	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
1,2-Dichloroethene (total)	NE	NE	NE	NE	NE	3.5 J·	ND	NA	ND	ND	ND	NS	ND	NS	5J	T
Acetone	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Benzene	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Chloride	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	20	NS	ND	NS	מא	
Chloroform	NE	NE	NE	NE	NE	4.6 J	4.6 J	4 J	ND.	ИD	ND	NS	ND	NS	ND	
cis-1,2-Dichloroethene	NE	NE	NE	NE	ÑE	ND	ND	ND	ND	ND	ND	NS	ND	NS	5 J	
Ethylbenzene	NE	NE	NE	NE	NE	ND	ND	ŊD	ND	ND	ND	NS	ND	NS	ND]
Methylene chloride	NE	NE_	NE	NE	NE	3 JB	2.6·JB	ND	ND	ND	ND	NS	ND	NS	ND	
Tetrachloroethene	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Toluene	NE	NE	NE	NE	NE	ND	ND	ND	МD	ND	ND	NS	ND	NS	ND	
trans-1,2-Dichloroethene	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Trichloroethene	NE	NE	NE	NE	NE	0.85 J	ND	ND	ND	ND	, ND	NS	ND	NS	ND	
Vinyl chloride	. NE	NE	NE	NE.	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	
Xylenes	NE	NE	NE	NE	NE	0.73 J	ND	ND	ND	מא	ND	NS	ND	NS	ND	
Lead	NE	NE	NE	NE	NE	ND	ND	ND	ND	ND	ND	NS	ND	NS	ND	

•													41.00				
	96C	96D	97.1								1	•			01B	01C	010
78-GW42															·		,
1,1,1-Trichloroethane	NE	NE	NE											- Line -	ND	NS	
1,1,2,2-Tetrachloroethane	NE	NE	NE	N is									•		ND	NS	
1,1,2-Trichloroethane	NE	NE	NE	NI:						11	i		•		ND	NS	
1,1-Dichloroethane	NE	NE	NE	- 3	·					1					180	NS	
1,1-Dichloroethene	NE	NE	ΝE		1					•					18	NS	<u> </u>
Acetone	NE	NE	NE				•							-	ND	NS	
Benzene	NE	NE	1.1										1.0		ND	NS	ļ
Chloroform	NE	NE	NT												ND	NS	
Chloromethane	NE	NE	NE	N1.										1	31	NS	
cis-1,2-Dichloroethene	NE	NE	NE											٠.	960 D	NS	
Ethylbenzene	NE	1 10													ND	NS	
Methylene chloride	NE	T NE			1.									٠	ND	NS	ļ
Tetrachloroethene	NE	NE	NE					•		:					. ND	NS	
Toluene	NE	NE	NI												ND	NS	
trans-1,2-Dichloroethene	NE	NE	Zï												24	NS	
Trichloroethene	NE	NE	i sees a susse												480 D	NS	ļ
Vinyl chloride	NE	NE	NE												12	NS	<u> </u>
Xylenes	NE	NE	NE									•			ND	NS	
Lead	NE	NE	NT												ND	NS	
Total 1,2-Dichloroethene	NE	NE	NE												960D	NS	<u> </u>
78-GW43																	
1,1,1-Trichtoroethane	NE	1 5													NS	ND	<u></u>
1,1,2,2-Tetrachloroethane	NE		•						•						NS	ND	
1,1,2-Triehloroethane	30														NS	מא	J
1,1-Dichloroethane	NE		:	'											NS	ND	
1,1-Dichloroethene	N														NS	ND	<u> </u>
Acetone	!		•													ND	
Dennena	14														NS	ND	<u> </u>
Chloroform	Nu														NS	ND	
cis-1,2-Dichloroethene	NF.					•									NS	53	J
Ethylhenzene	J NO		•												NS	ND	I
Methylene chlocide	<u> </u>														NS	ND	
Tetrachloroethene	NL.	<u> </u>													NS	ND	<u> </u>
Toluene	NE	NE	NI.												NS	3 J	Ĭ
trans-1,2-Dichloroethene	NE	NE	71.												NS	7	
Trichloroethene	NE	NE	NE							• • • • • • • • • • • • • • • • • • • •					NS	ND	
Vinyl chloride	NE	NE	NΕ										•		NS	180	
Xylenes	NE	NE				•					•			٠.	NS	7	
Lead	NE	NE			•		•		***	` :		111			NS	ND	
Total 1,2-Dichloroethene	NE	NE	NE	***											. NS	60	
		······································										•					

	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	0110
78-GW44	, ,,,,	1 312	,		,		•	,	,		·					111-111-11
1,1,1-Trichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
1.1.2.2-Tetrachloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	T
1.1.2-Trichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
1,1-Dichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
1,1-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Acetone	NE	NE	NE	NE	NE	NE	. NE	NE	NE	NE	NE	ND	ND	NS	ND	
Вепделе	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE_	3 J	3 J	NS	4 J	
Chloroform	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	L
cis-1,2-Dichtoroethene	NE	NE	NE	NE	NE_	NE	NE	NE	NE	NE	NE	200	520 D	NS	2700	
Ethylbenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	I
Methylene chloride	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	Ţ
Tetrachloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Toluene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	11	9	NS	9	
trans-1,2-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	26	26	NS	36	1
Trichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	T
Vinyl chloride	NE	NE .	NE	NE	NE	NE	NE	NE	NE	NE	NE	5000 D	6700 D	NS	5800	T
Xylenes	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	8	10	NS	11	
Lead	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	1
Total 1,2-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NR	NE	NE	. NE	230	320	NS	2800	
78-GW45					·											
1,1,1-Trichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
1,1,2,2-Tetrachloroethane	NE	NE	NE	NE	NE	NE	NE	NE_	NE	NE	NE	ND	ND	NS	ND	T
1,1,2-Trichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE.	NE	NE	ND_	ND	NS	ND	
1,1-Dichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	1
1,1-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	1
Acetone	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Benzene	NE	NE	NE	NE	NE	_ NE	NE	, NE	NE	NE	NE	ND	ND.	NS	ND	
Chloroform	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ИD	ND	NS	ND	
cis-1,2-Dichloroethene	NE	NE	NE-	NE	NE	NE	NE	NE	NE	NE	NE	_ND_	ND	NS	ND]
Ethylbenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND_	ND	NS	ND	
Methylene chloride	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	_ND_	ND	NS	ND	
Tetrachloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	1
Toluene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
trans-1,2-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Trichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Vinyl chloride	NE	NE .	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Xylenes	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	T
Lead	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND .	NS	ND	
Total 1,2-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	

	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	000	01A	01B	01C	010
78-G\V46	<u> </u>			<u> </u>		·			·							
1.1.1-Trichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
1.1.2.2-Tetrachloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
1,1,2-Trichloroethane	NE	NE	NE	NE	NE	NE	NE	NE_	NE	NE	NE	ND	ND	NS	ND	T
1,2-Dichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	4 J	ND	NS	ND	T
1,2-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	T
Acetone	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	6 J	NS	ND	
Benzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ŇE	290 D	100	NS	950	
Chloroform	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	T
cis-1,2-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	3 J	3 J	NS	9	I
Ethylbenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	100	32	NS	540	
Methylene chloride	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Tetrachloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Toluene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	14	3 J	NS	20	Ii
trans-1,2-Dichloroethene	NE	NE	NE_	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Trichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Vinyl chloride	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	T
Xylenes	NE	NE	NE	_NE	NE	NE	NE	NE	NE	NE	NE	320	46	NS	350	
Lead	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Total 1,2-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	3J	3J	NS	9	
78-GW47																
1,1,1-Trichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	DN	NS	ND	T
1,1,2,2-Tetrachloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
1,1,2-Trichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
1,2-Dichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
I,2-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	T
Асетоле	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Benzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	3. J	ND	NS	ND	
Chloroform	NE_	NE	NE	NE	NE	NE	NE	NE	NE	NE_	NE_	ND	ND	NS	ND	
cis-1,2-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE_	NE	260 D	61	NS	98	
Ethyibenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE_	NE	100	ИD	NS	ND	
Methylene chloride	NE	NE_	NE	NE	NE	NE	NE	NE	NE .	NE	NE	ND	ND	NS	ND	
Tetrachloroethene	NE_	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Toluene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
trans-1,2-Dichloroethene	NE_	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	6	ND	NS	ND	
Trichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	240 D	44	NS	45	
Vinyl chloride	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	4	1 J	NS	2 J	
Xylenes	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	ND	NS	ND	
Lead	NE	NE	· NE	NE	NE	NE	NE	NE	ΝE	NE	NE	ND	ND	NS	ND	
Total 1,2-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	270D	61	NS	100	

TR-GWKS			1	· · · · · · · · · · · · · · · · · · ·		1 050	1 661	1 000	00:	000	004	00C	00D	014	0172	010	610
1,1-17-finblorochizer		96C	96D	97A.	97B	97C	98A	98C	99A	99C	00A) 00C	1 00D	01A	01B	01C	WHI I
1.1.2.Triendoprochabae NE NF NF NF NF NF NF NF				1		1 175	5,177	T NG	NE	NE	N/IE	Atre	l NID	ND	Ne	ND	
1,1,2-Triedeposenhane																	+
JDebinstrateure N.E. N																	
J. Debelstromethone																	
1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0																	
2-Bustanore																	\
Actions																	
Bentzea NE NE NE NE NE NE NE N																	
Chlorobrance																	
Chieroform																	+
Cont-1_Confederate NE																	
Edystyleszene																	
Mathythm chloride																	
Testachlorocthene																	
Tolues																	
																	
Trichloroethene											·						+
Virto thoride																	+
Xylenes									_~								~
Lead																	1
Total 1,2-Dichloroethene																	
13.1-17.11.01.07.00.01.00.01.00.01.00.01.00.01.00.01.00.01.00.01.00.01.00.01.00.01.00.01.00.01.00.01.00.01.00.01.00.01.00.00								·									
1.1.1-Trichforcethane		I INE	INE	INE	I NE	I OE	INE	I NE	11/15	IVE	INE	I NE		1 12	143	J	_
1,1,2,2-Tetrachforosthane		NE	ME	NE	ME	NE	NE	ME	NE	NE	NE	NE	NE	NE	ND	NIS	1
1,1-2-Trichloroethane										 							
1,2-Dichloroethane																	
1.2-Dichlorosthene NE																	
Acetone								 									
Benzene NE																	
Chloroferm																	+
Cis-1,2-Dichloroethene NE																	
Ethylbenzene																	
Methylene chloride NE																	
Tetrachloroethene																	
Toluene																	
Urans-1,2-Dichloroethene																	
Trichloroethene NE																	
Vinyl chloride NE	Trichloroethene																1
Xylenes NE	Vinyl chloride				NE				NE								
Lead	Xylenes	NË			NE			NF.									
Total 1,2-Dichloroethene	Lead																
1,1,1-Trichloroethane	Total 1,2-Dichloroethene																
1,1,2,2-Tetrachloroethane NE	78-GW50	1	1 · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·		<u> </u>	· · · · · · · · · · · · · · · · · · ·		<u> </u>)		1	1		1	
1,1,2,2-Tetrachloroethane NE	1,1,1-Trichloroethane	NE NE	NE I	NE	NE	NE	NE	NE	NE	NE	NE.	NE.	NF.	NE I	ND	l Ns	
1,1,2-Trichloroethane NE NE </td <td></td> <td>1</td>																	1
1,2-Dichloroethane NE																	+
1,2-Dichloroethene NE																	
Acetone NE NE <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>+</td></t<>																	+
Benzene	Acetone																
Chloroform NE																	+
		· · · · · · · · · · · · · · · · · · ·															1

							T		000					1	· · · · · · · · · · · · · · · · · · ·	Total Control of the
	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	01D
Ethylbenzene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	NS	ļ <u>-</u>
Methylene chloride	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	NS	<u> </u>
Tetrachloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	NS NS	
Toluene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	NS NS	
trans-1,2-Dichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE NE	ND ND	NS	┼──
Trichloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE NE	ND ND	NS NS	├
Vinyl chloride	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE NE	NE NE		NS NS	
Xylenes	NE	NE	NE	NE	NE	NE	NE NE	NE	NE	NE	NE	NE	NE NE	ND	NS NS	
Lead	NE	NE	NE_	NE	NE NE	ND	NS NS	 								
Total 1,2-Dichloroethene 78-GW51	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE_	NE	NE	IVE	7	I NO	<u></u>
1,1,1-Trichtoroethane	NE	NE	NE	NE	NE	NE.	NE	NE	NE	I NE	NE	I NE	NE	ND	T NS	т——
1,1,2,2-Tetrachioroethane	NE NE	NE	NE	NE	NE	NE NE	NE	NE	NE NE	NE	NE	NE	NE	ND	NS NS	
1.1.2-Trichforoethane	NE	NE	NE	NE	NE	NE NE	NE	NE	NE	NE	NE	NE	NE NE	ND	NS	
1.2-Dichloroethane	NE NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	NS	
1,2-Dichloroethene	NE	NE	NE NE	NE NE	NE NE	NE NE	NE	NE NE	NE	NE NE	NE	NE	NE	ND	NS	
Acetone Acetone	NE NE	NE	NE	NE	NE NE	NE NE	NE	NE NE	NE NE	NE	NE	NE NE	NE	ND	NS NS	
Benzene	NE NE	NE	NE NE	NE NE	NE NE	NE	NE	NE	NE	NE	NE	NE NE	NE	ND	NS	
Chloroform	NE NE	NE	NE	NE	NE NE	NE NE	NE	NE	NE	NE	NE	NE	NE	ND	NS	
cis-1,2-Dichloroethene	NE	NE	NE	NE NE	NE NE	NE NE	NE	NE NE	NE	NE	NE	NE	NE	ND	NS	
Ethylbenzene	NE NE	NE	NE	NE	NE NE	NE	ND	NS	 							
Methylene chloride	NE	NE	NE	NE NE	NE	ND	NS	 								
Tetrachloroethene	NE	NE	NE	NE	NE	NE	NE	NE	NE NE	NE	NE	NE	NE NE	ND	NS	
Toluene	NE	NE	NE	NE NE	NE NE	NE NE	NE	NE	NE	NE	NE	NE	NE	ND	NS NS	
trans-1.2-Dichloroethene	NE NE	NE	NE	NE	NE	NE	NE	NE NE	NE	NE	NE	NE NE	NE NE	ND	NS	
Trichloroethene	NE NE	NE	NE NE	NE	NE NE	NE NE	NE NE	ND	NS NS	 						
Vinyl chloride	NE NE	NE NE	NE NE	NE NE	NE NE	NE	NE NE	NE	NE	NE	NE	NE NE	NE	ND	NS	
Xylenes	NE NE	NE NE	NE	NE NE	NE NE	NE NE	NE NE	NE	NE	NE NE	NE	NE NE	NE	ND	NS	
Lead	NE NE	NE	NE NE	NE	NE NE	NE	NE	NE NE	NE	NE	NE	NE	NE	ND	NS NS	
Total 1,2-Dichloroethene	NE NE	NE	NE	NE	NE	NE	NE NE	NE	NE	NE	NE	NE	NE	ND	NS	
78-GW52	112	1 112		1415	I NE	1	1425	1112	140	VL	IVE	ING	I INE	IND	143	<u> </u>
1.1.1-Trichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	NS	
I,1,2,2-Tetrachloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE NE	NE	ND	NS	
1,1,2-Trichloroethane	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	NS	
1.2-Dichloroethane	NE NE	NE	NE NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	ND	NS	
1,2-Dichloroethene	NE NE	NE	NE	NE	NE	NE	NE	NE NE	NE	NE	NE	NE NE	NE	ND	NS	
Acetone	NE	NE	NE	NE	NE	NE NE	NE	NE	NE	NE	NE NE	NE NE	NE NE	95	NS	
Benzene	NE	NE	NE	NE	NE	NE NE	NE NE	NE NE	NE NE	NE	NE NE	NE NE	NE NE		NS NS	
Chloroform	NE	NE NE	NE	NE	NE NE	NE	NE NE	NE NE	NE NE	NE NE	NE NE	NE NE	NE ·	1200 D	NS NS	
Chloromethane	NE	NE NE	NE NE	NE	NE NE	NE NE		142								
cis-1,2-Dichloroethene	NE	NE	NE	NE	NE NE	NE	NE NE	NE NE	NE NE	NE NE	NE NE	NE NE	NE NE	18 1700 D	NS	
Ethylbenzene	NE	NE	NE	NE	NE	NE NE	NE NE	NE	NE NE	NE NE	NE NE	NE NE	NE NE		NS NS	
Methylene chloride	NE	NE	NE .	NE	NE	NE NE	NE	NE	NE NE	NE NE	NE NE	NE NE	NE NE	23	NS NS	
Tetrachloroethene	NE	NE	NE	NE	NE	NE NE	NE	NE NE	NE NE	NE NE	NE NE	NE NE	NE NE	ND 26	NS NS	ļ
Toluene	NE	NE	NE	NE	NE	NE NE	NE	NE	NE	NE NE	NE NE	NE NE	NE NE		NS NS	
trans-1,2-Dichloroethene	NE	NE	NE ,	NE	NE NE	NE NE	NE	NE NE	NE NE	NE	NE NE	NE NE		28		
Trichloroethene	NE NE	NE	NE	NE	NE	NE	NE NE	NE	NE NE	NE NE	NE NE	NE NE	NE NE	75 8300 D	NS	
Vinyl chloride	NE	NE	NE	NE	NE	NE	NE NE	NE NE	·NE	NE NE	NE NE	NE NE	NE NE	8300 D	NS	
Xylenes	NE	NE	NE	NE NE	NE	NE	NE NE	NE NE	NE NE	NE NE	NE NE	NE NE	NE NE		NS	ļ
Lead	NE	NE	NE	NE I	NE (NE	NE NE	NE NE	NE	NE	NE NE	NE NE		21	NS	
Total 1.2-Dichloroethene	NE NE	NE	NE NE	NE NE	NE	NE NE	NE NE	NE NE	NE NE	NE NE	NE NE	NE NE	NE NE	ND 1800 D	NS NS	
78-RW05	1					1.5	1,1		1715	115	1.0	INE	INE	10001	INO	L
1.1-Dichloroetlane	NA	NA	NA	NA I	NA]	NA I	NA	NA)	NA	ND	ND	NS }	ND	ND	No.	·
		1463		1717	<u></u>	1351			INA.	ND.	1717	1/2	UND	ND	NS	L

3/6/02 15:08

	96C_	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	011)
1,1-Dichloroethene	NA_	NA	ND	ND	NS	ND	ND	NS	Ī							
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA_	ND	ND	NS	ND	ND	NS	
Benzene	NA	NA	NA	NA	NA	NA	NA	NA.	NA	ND	ND	NS	ND	ND	NS]
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	T
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	33	ND	NS	50	120	NS	
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	T
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Toluene	NA_	NA	ND	ND	NS	ND	ND	NS								
Total 1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	33	ND	NS	50	130	NS	
trans-1,2-Dichloroethene	NA	NA	NA.	NA	NA	NA	NA	NA	NA	ND	ND	NS	מא	ND	NS	
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	49	ND	NS	42	120	NS	
Vinyl Chloride	NA NA	NA	NA	NA	NA	NA	NA	NA	NA	3	ND	NS	16	45	NS	T
Xylenes (Total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	4J	NS	

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SITE 78 SAMPLE HISTORY

Last Updated

i	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D .	01A	01B	01C	910
78-RW06	NA	NA	NA	NA	NA	NA	NA.	NA	NA	ND	10	NS	ND	ND	NS	
1.1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	3 J	ND	NS	ND	ND	NS	
1.1-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	13	NS	ND	ND	NS	
Acetone	NA	NA .	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ИD	NS	ND	ND	NS	
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA _	NA	ND	ND	NS	ND	ND	NS	1
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	100	77	NS	ND _	ND	NS	
Ethylbenzene	NΛ	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Total 1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	100	77	NS	ND	ND	NS_	
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	36	5	NS	ND	ND	NS	
Vinyl Chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	23	ND	NS	ND	ND	NS	
Xylenes (Total)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS_	
78-RW07																
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
2-Butanone	NA	NA	NA_	NA	NA	NA	NA	NA	NA	ND	ND	NS .	ND	ND	NS	
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	, NS	
Benzene	NA	NA	NA	NA	NA.	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Chloroform	NA	NA	NA	NA	NA_	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
cis-1,2-Dichloroethene	NA	NA	NA	NA	NΑ	NA	NA	NA	NA	7	7	NS	8	ŊŊ	NS	
Ethylbenzene	NA	NA	NA	NA	NA.	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ИD	ND	NS	ND	ND	NS	
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Trichloroethene	NA	NA	NA	NA	NA	NA	NA_	NA	NA	7	5 J	NS	ND	ND	NS	
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Xylenes	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Total 1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	7	7	NS	8	ND	NS	1

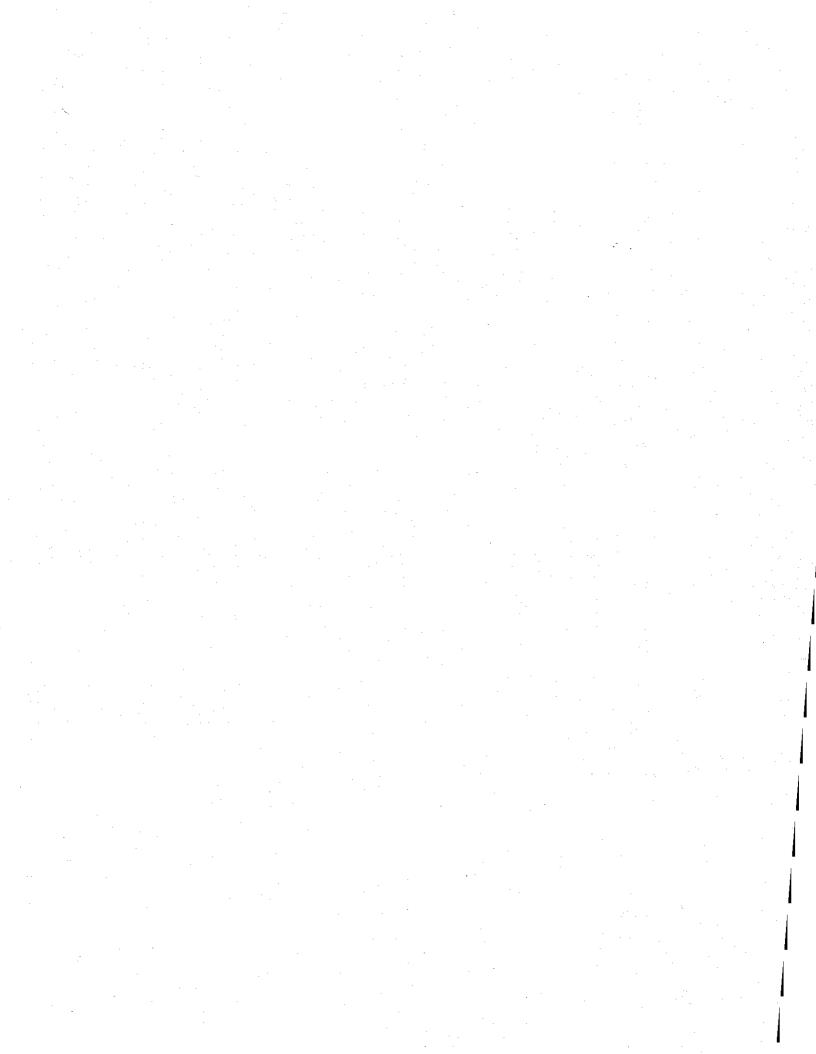
:	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	910
78-R\V08	, ,,,	, ,,,,	, ,,,,				'		'							
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ИD	ND	NS	ND	ND	NS	<u> </u>
1,2-Dichlorgethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,2-Dichtoropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
2-Butanone	NA	NA	NA	NA	NA	NA	NA .	NA	NA	ND	ND	NS	ND	ND	NS	
Acetone	NA	NA	NA	NA	NA	NA	NA	NΛ	NA	ΝD	ND	NS	ND	ND	NS	
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	.l
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	<u> </u>
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	<u> </u>
cis-1,2-Dichloroethene	NA	NA	NA	NA NA	NA	NA	NA .	NA	NA	6	20	NS	ND	3 J	NS	1
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Methylene chloride	NA	NA	NA	NA	NA	NA	NA -	NA	NA	ND	ND	NS	ND	ND	NS	
Tetrachioroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	6	NS	ND	5	NS	
Vinyi chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Xylenes	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	T
Total 1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	6	20	NS	ND	3J	NS	
78-RW09																
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
1, 1, 2, 2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA_	NA	NA	NA	NA	NA	ND	ND	NS	
1,1,2-Trichloroethane	NA	NA	NA	NA	NΑ	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ΝA	ND	ND	NS	
1,2-Dichloroethene	NA	NA	NA	NA	NΑ	NA	NA	NA	NA	NA	NA	NΑ	ND	ND	NS	
1,2-Dichloropropane	N <u>A</u>	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	I4	ND	NS	
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA_	NA	NA	NA	NA	NA	ND	ND	NS	
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND ·	ND	NS	
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3	2.J	NS	1
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ÑA	ND	ND	NS	
Xylenes	NA	NA	NA	NA	ÑA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	
Total 1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	

		· · · · · · · · · · · · · · · · · · ·		Y	T			004	000		- 000	000			010	T-000 WWW.
<u></u>	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	010
78-RW10	····				·	r	1			200 5		110	- 40		100	·
Benzene	NA.	NA	NA	NA.	NA NA	NA	NA	NA	NA	200 D	200	NS	29	NS	120	<u> </u>
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	190 D	200	NS	96	NS	640	ļ
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA_	NA	NA	85	69	NS	4	NS	4J	<u> </u>
Toulene	NA	NA	NA	NA	NA	NA	NA	NA	NA	18	9	110	- 24	210		
Total 1,2-Dichloroethene	NA	NA NA	NA	NA	NA	NA	NA	NA_	NA	190 D	200	NS	96	NS	650	
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA_	NA	NA	ND	ND	NS	ND	NS	ND 146	
Trichloroethene	NA	NA	NA	NA	NA	NA	NA_	NA	NA	140	100	NS	64	NS	140	
Vinyl Chloride	NA	NA	NA	NA	NA	NA	NA_	_NA	NA	21	3	NS	ND	NS	8	
Xylenes (Total)	NA	NA	NA	NA	NA	NA_	NA_	NA	NA	120	180	NS	20	NS	- 8	<u> </u>
78-RW11			T	,								N 10				
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA_	NA	NA	ND	ND	NS	ND	NA	ND	ļ. <u></u>
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
1,2-Dichloroethane	NA_	NA	NA	NA	NA_	NA_	NA	NA	NA	ND	ND	NS	ND	NA	ND	ļ. <u></u> .
1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	ļ <u>.</u>
1,2-Dichloropropane	NA_	NA	NA	NA	NA	NA_	NA	NA	NA	ND	ND	NS	ND	NA.	ND	<u> </u>
2-Butanone	NA	NA	NA	NA	NA	NA_	NA	NA	NA	ND	ND	NS	DИ	NA	ND	
Acetone	NA	NA	NA	NA	NA	NA_	NA_	NA	NA	ND	ND	NS	ND	NA	ND	<u> </u>
Benzene	NA_	NA	NA	NA	NA	NA_	NA	NA	NA	ND	ND	NS	ND	NA	ND	<u> </u>
Chlorobenzene	NA	NA	NA	NA	NA_	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ДИ	NA	ND	<u> </u>
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	9	ND					<u> </u>
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	290 D	160	NS	180	NA	190	ļ
Ethylbenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	ļ
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ИD	NA	ND	
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
trans-1,2-Dichloroethene	NA	NA_	NA	NA	NA	NA	NA	NA	NA	ND	3 J	NS	5 J	NA	7	ļ
Trichloroethene	NA NA	NA	NA.	NA	NA	NA	NA	NA	NA	140	ND	NS	ND	NA	ND	<u> </u>
Vinyl chloride	NA .	NA	NA	NA	NA	NA	NA	NA	NA	21	190 D	NS	540 D	NA	1200	
Xylenes	NA	NA_	NA	NA	NA	NA	NA	NA	NA	120	ND	NS	ND	NA	ND	
Total 1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	290 D	160	NS	180	NA	200	<u> </u>
78-RW12								·								
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	<u> </u>
1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	1
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	3 J	NS	ND	NA	ND	
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	7	
Chlorobenzene	NA	NA	NA_	NA	NA_	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	· ·
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	1200 D	NS	ND	NA	ND	
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	10	ND	NS	ND	NA	2300	
Ethylbenzene	NA	NA	NΑ	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
Methylene chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	ИD	ND	NS	ND	NA	ND	
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	
Toluene	NA	NA	NΑ	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	NA	ND	1
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	14	NS	ND	NA	18	
Trichloroethene	NA	NA	NA	NA	NA	NA	NΑ	NΑ	NA	6	430 D	NS	ИD	NA	1100	Ţ
Vinyl chloride	NA	NA _	NA	NA	NA	NA	NA	NA	NA	ΝD	16	NS	ND	NA	25	T

	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C 01D
Xylenes	NA	2 J	ND_	NS	ND	NA	4 J								
Total 1,2-Dichloroethene	NA	10	1200 D	NS	ND	NA	2400								

	0.60	000	07.1	97B	97C	98A	98C	99A	99C	00A	00C	Q00	01A	01B	01C	0110
78-RW13	96C	96D	97A	9/15	J 9/C	701	J 36C))A	, ,,,	004	1 000	000	UIA	O L D	UIC.	10000000
1.1.1-Trichloroethane	NA NA	NA	NA	l NA	I NA	NA NA	NA NA	NA	NA	ND	ND	NS	ND	ND	NS	T
1,1,2,2-Tetrachloroethane	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA	NA.	ND	ND	NS	ND	ND	NS	1
1,1,2-Trichloroethane	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA.	NA	NA	ND	ND	NS	ND	ND	NS	 -
1.1-Dichloroethane	NA NA	NA NA	NA NA	NA	NA NA	NA NA	NA NA	NA NA	NA	4.1	30	NS	110	110	NS	
1,1-Dichloroethene	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	3 1	3 J	NS	10	14	NS	
1,2-Dichloropropane	NA NA	NA NA	NA NA	NA	NA NA	NA NA	NA NA	NA NA	NA NA	ND	ND	NS	ND	ND	NS	
2-Butanone	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	ND ND	ND	NS	ND	ND	NS	+
Acetone	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA.	NA NA	ND	6.1	NS	ND	ND	NS	
Benzene	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	ND	ND	NS	3 J	3 J	NS	
Chlorobenzene	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA	NA NA	ND	ND	NS	ND	3 J	NS	
Chloroform	NA NA	NA	NA NA	NA NA	NA NA	NA NA	NA	NA.	NA	42	ND	NS	ND	ÜЙ	NS	1
cis-1,2-Dichloroethene	NA NA	NA	NA NA	NA NA	NA	NA	NA NA	NA NA	NA	ND ND	220 D	NS	740 D	780 D	NS	
Ethylbenzene	NA NA	NA	NA NA	NA NA	NA NA	NA NA	NA	NA	NA NA	ND	ND	NS	ND	ND	NS	
Methylene chloride	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	ND	ND	NS	ND	ND	NS	}
Tetrachloroethene	NA NA	NA NA	NA.	NA NA	NA	NA NA	NA.	NA	NA.	ND	ND	NS	ND	ND	NS	
Toluene	NA NA	NA.	NA NA	NA NA	NA NA	NA NA	NA NA	NA	NA NA	- ND	ND	NS	ND	ND	NS	
trans-1,2-Dichloroethene	NA NA	NA	NA.	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	ND	ND	NS	2 J	ND	NS	+
Trichloroethene	NA	NA	NA	NA	NA NA	NA.	NA	NA.	NA NA	68	31	NS	88	96	NS	+
Vinyl chloride	NA	NA	NA NA	NA	NA NA	NA NA	NA NA	NA NA	NA.	2	3	NS	28	41	NS	
Xylenes	NA NA	NA NA	NA NA	NA NA	6	ND	NS	ND ND	ND ND	NS	+					
Total 1.2-Dichloroethene	NA	NA.	NA	NA	NA NA	NA NA	NA	NA.	NA	42	220 D	NS	590	780D	NS	
78-RW14		1. 131.				L	1			<u> </u>	12201		1	, 7002	110	.1
1.1.1-Trichloroethane	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NS	NS	NS	ND	ND	NS	
1,1,2,2-Tetrachloroethane	NA	NA	NA.	NA	NA.	NA	NA	NA	NA	NS	NS	NS	ND	ND	NS	1
1.1.2-Trichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS	NS	NS	ND	ND	NS	
1.2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS	NS	NS	ND	ND	NS	1
1.2-Dichlorgethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS	NS	NS	ND	ND	NS	
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS	NS	NS	ND	ND	NS	
2-Butanone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS	NS	NS	ND	ND	NS	1
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS	NS	NS	75	110	NS	
Benzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS	NS	NS	5	ND	NS	
Chlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS	NS	NS	ND	ND	NS	
Chloroform	NA	NA	ΝA	NA	NA	NA	NA	NA	NA	NS	NS	NS	ND	ND	NS	
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA.	NA	NA	NA	NA	NS	NS	NS	4 J	3 J	NS	
Ethylbenzene	NA	NA	NA	NA	NA .	NA	NA	NA	NA	NS	NS	NS	280 D	39	NS	
Methylene chloride	NA	NA	NA	ÑA	NA	NA	NA	NA	NA	NS	NS	NS	ND	ND	NS	1
Tetrachloroethene	NA	NA	NA	NA	NA.	NA	NA	NA	NA	NS	NS	NS	ND ·	3 J	NS	
Toluene	NA	NA	NA	NA	NA NA	NA	NA.	NA	NA.	NS	NS	NS	89	10	NS	
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA NA	NA	NA	NS	NS	NS	ND	ND	NS	
Trichloroethene	NA	NA	NA	NA	NA	NA	NA NA	NA.	NA NA	NS	NS	NS	ND	ND	NS	1
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA NA	NA NA	NS	NS	NS	ND	ND	NS	
Xylenes	NA	NA	NA	NA NA	NA	NA	NA NA	NA NA	NA NA	NS.	NS	NS	1200 D	110	NS NS	
Total 1,2-Dichloroethene	NA NA	NA	NA NA	NA	NA NA	NA	NA NA	NA	NA NA	NS	NS	NS	4J	3.5	NS	1
	****		1771			1,0		117	1.73	140	11/2	17.0	47) J	1/19	I

	96C	96D	97A	97B	97C	98A	98C	99A	99C	00A	00C	00D	01A	01B	01C	010
RW15	•	•	•			<u>'</u>								·		
I,1,1-Trichloroethane	NA	NA.	NA	NA	NA_	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,1,2,2-Tetrachloroethane	NA	NA	NA	NA.	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NΛ	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
2-Butanone	NA	NA	NA	NA	NA_	NA	NA	NA	NA	28	61	NS	ND	9.3	NS	<u> </u>
Acetone	NA	NA	NA	NA	NA_	NA	NA	NA	NA	18	DND_	NS	110	11	NS	
Benzene	NA NA	NA.	NA NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Chlorobenzene	NA	NA	NA	NA	NA_	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Chloroform	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	600 D	83	NS	46	82	NS	
Ethylbenzene	NA	NA	NA	NA	NA_	NA	NA	NA	NA	190	ND	NS	48	4 J	NS	
Methylene chloride	NA	NA	NA	NA	NA	NA NA	NA	NA	NA	30	ND	NS	ND	ND	NS	1
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	24	ND	NS	3 J	4 J	NS	_
Toluene	NA	NA	NA	NA	NA	NA	NA	NA	NA	120	ND	_NS	9	12	NS	
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ИD	ND	NS	
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA	8600 D	91	_NS	3900 D	6500 D	NS	
Vinyl chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	NS	ND	ND	NS	
Xylenes	NA	NA	NA	NA NA	NA	NA	NA	NA	NA	2000 D	42	NS	920 D	3400 D	NS	
Total 1,2-Dichloroethene	NA	NA	NA NA	NA	NA _	NA	NA	NA	NA	600 D	83	NS	46	82	NS	



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On Site 1110 Am 15t Spoon 1720	7 - 7 8 0	
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	RBURDEN WELL NO. H-P-G	u II
PROJECT Camp Lejeine - 1+0/A PROJECT NO 19 - COC - BORING NO. ELEVATION DATE	DRILLER Dr./ling DRILLING METHOD Hollow Stein DELVELOPMENT METHOD	Co.
GROUND ELEVATION		5.49° 58.36° 58.36°
	- I.D. OF SURFACE CASING: 5" TYPE OF SURFACE CASING: Carbor steel - RISER PIPE I.D. 2" TYPE OF RISER PIPE: Schooling 40 (") - BOREHOLE DIAMETER: 6"	· · · · · · · · · · · · · · · · · · ·
	- ELEVATION/DEPTH TOP OF SEAL: - TYPE OF SEAL: Dentente Partets - DEPTH TOP OF SAND PACK: - ELEVATION/DEPTH TOP OF SCREEN: - TYPE OF SCREEN: Schedule 40 PVC - SLOT SIZE X LENGTH: 0.010 / X20' - TYPE OF SAND PACK: Course schools and	3'
	- ELEVATION/DEPTH BOTTOM OF SCREEN: ELEVATION/DEPTH BOTTOM OF SAND PACK: TYPE OF BACKFILL BELOW OBSERVATION WELL: - ELEVATION/DEPTH OF HOLE	25' 25.5'
NOT TO SCALE		WG.WMGBVO

FOR OFFICE USE ONLY

Serial No. _

__ Long. _____ Pc __

Quad. No.,

Minor Basin.

Submit original to Division of Environmental Management and copy to well owner.

Lat._

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (819) 733-5083

GW-1 Revised 11/84

WELL CONSTRUCTION RECORD	Header Ent GW-1 Ent
DRILLER REGISTRATION NUMBER Pending	STATE WELL CONSTRUCTION PERMIT NUMBER: 66-0/35- WM - 014
1. WELL LOCATION: (Show sketch of the location below) Nearest Town: Sign (SOAVI) (-1) N.C. (Road, Community, or Subdivision and Lot No.) 2. OWNER Sign (Street or Route No.) 8542 City or Town State Zip Code 3. DATE DRILLED 11/18/86 USE OF WELL 1101/10/ 4. TOTAL DEPTH 25.5 CUTTINGS COLLECTED 11/16/11/10/	County: Ons/OW Depth DRILLING LOG From To Simplem Description 3.0-4.5 Simplem Sand 4.5-105 Simplem Sand 4.5-105 Simplem Sand 4.5-105 Simplem Sand 19.0-20.5 Simplem Sand 24.0-25.5 Character Middle
5. DOES WELL REPLACE EXISTING WELL? Yes Who 6. STATIC WATER LEVEL: 13, 57 FT. Dabove TOP OF CASING, TOP OF CASING IS 2,50 FT. ABOVE LAND SURFACE. 7. YIELD (gpm): METHOD OF TEST 8. WATER ZONES (depth):	
9. CHLORINATION: Type Amount	If additional space is needed use back of form. LOCATION SKETCH (Show direction and distance from at least two State Roads, or other map reference points)
From To Ft. 11. GROUT: Depth Material Method From Ord To 3.0 Ft. Carreto From To St. Carreto 12. SCREEN:	See Fig (2-5)
Depth Diameter Slot Size Material From To St in in in in	
14. REMARKS: I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROSIGNATURE OF CO	IN ACCORDANCE WITH 25 NCAC 2C, WELL CONSTRUCTION OWNER. ONTRACTOR OR AGENT DATE

Boring No HPGU CLEJ-00414-03.13-04/01/92								
Hole Size 6"	Slot	: <u>E</u>	, 1					
Screen Size 2 "		Filter Materials Si/rca	Sand					
esing Size Z"	Hat'I PVC	Grout Type Bentonite Pollets.						
Ge rest David L	3 rentlinger	Development						
Date Start 11/18/86	Finish ///8	Static Water Level	11.701					
Contractor E	SE'	Top of Well Elevation	图 14.201					
Driller Dav	is	Drill Type Hollow Sy	em Augst					
•		•	· ·					

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
0.0-1.5			54 3.75/1, very dark grey, Silty Clayer Fine Sand, (Silt + Clay 40%), Slightly dense moist, Clay plastic	sm SC	4. 19. 3
1.5-3.0			2.5 4 4.5/4 Brown- light olive Brown, Silty Fine Sand with Silty Clay layers, (Silty Clay 20-30%), Slightly densi Clay 15 plastic, moist	sm	3 2 3
3.0- 4.5	•		10 ye 7.8/z, white - very Pale Brown, Sily Fine Sand, (Silt 20%), loose, moist, non plastic	SM	3 3 6
4.5-6.0	·		10 Pe 7/7.5 very Pale Brown- yellow, Silty Fine Sand, (silt 20%), Bright Yellow Brown mottles throughout, moist Slightly dense, non plastic	SM	6 8
6.0-9.5			10 YR 6/8 Brown Yellow Silly Fine Sand (Silt 35%), moist, Slightly dense, non Plastic	3m	7 9

Boring No. · HP GC	CLEJ-0041	4-03.13-04/01/92
Hole Size	Slot	<u>E</u>
Screen Size	Mat'l	Filter Materials
asing Size	Mat'l	Grout Type .
Ge ogist		Development
Date Start	Finish	Static Water Level
Contractor		Top of Well Elevation
Driller		Drill Type
		•

* 1 15/19 1

Depth (feet)	Sample	Sketch	Lithology, Color	vscs	SPT (BL/FT)
7.5-9.0			Same as 4 bove (6.0-7.5)	Sm	9 6 7
9.0-10.5			10 ya 7.5/z, Very Pale Brown, S. 1ty Clayey Sand, (Silt + Clay 40%) Slightly plastic moist-wet, Slight-mod. denzi	37.7	736
14.0-15.5			10 YR 8/2 While - Kery Pale Brown, Silty fine - mod. Sina, (silt 10-15%), 10% nors si- motiles, Sona is wet, rio dense, non plast.	S.J.	10 中 10
19.0-20.5		-	med. Sand with (10-15%) Coarse material, loose, wet, non plastic	SW	11 15 6
24.0-24.5			10 YR 8/1 white Silty Clayey med. Sand, (Silt + Clay layers 25%), 10% Coarse Sand, wet, Clay plastic, mod. dense-dense	SC SW	5 16 7
•					

APPENDIX F.2 BUILDING HP902 SOIL GAS INVESTIGATION (ESE, APRIL 1992)

were inspected to identify the general purpose of each and note any interconnections. The records search identified several primary potential sources of contamination. They are:

- An underground tank utilized for storage of trichloroethene (TCE)
 adjacent to Bldg. 902. The area around Bldg. 902 was identified as
 a long-term vehicle maintenance area.
- The Base Maintenance Shop (Bldg 1202), located in the north-central portion of HPIA, was identified as a potential contaminant source because of documented VOC storage and usage.
- Bidg. 1602, located in the south-central portion of HPIA, was identified as a heavy vehicle maintenance facility with a long term record of VOC storage and usage.

5.2 <u>SOILS INVESTIGATION</u>

The shallow soils at the HPIA were investigated using soil gas screening and soil borings for the collection of analytical samples. Soil gas results were used to locate potential source locations following the record search and to aid in determining the location of groundwater monitoring wells. Analytical samples collected from soil borings were used to characterize the soils in the source areas as identified during the soil gas survey.

5.2.1 Soil Gas Survey

Each of the areas identified by the records search as potential sources of VOCs was investigated with the use of the soil gas technique. This section discusses those areas in which VOC contamination was detected in the soil gas. Original soil gas sampling location maps and all soil gas analytical data is presented in Appendix P.

Bldgs. 901, 902, and 903

The IAS identified the presence of a 440-gallon (gal) underground tank at Bldg. 901. This tank was used for storage of TCE that was used to degrease engines. Available information at the time of the IAS indicated that the contents of the tank had been drained and sent to the Defense Property Disposal Office (DPDO), which now operates under the title of the Defense Reutilization and Marketing Office (DRMO). No information regarding spills, leaks, or discharges from the tank while it was in active use was available.

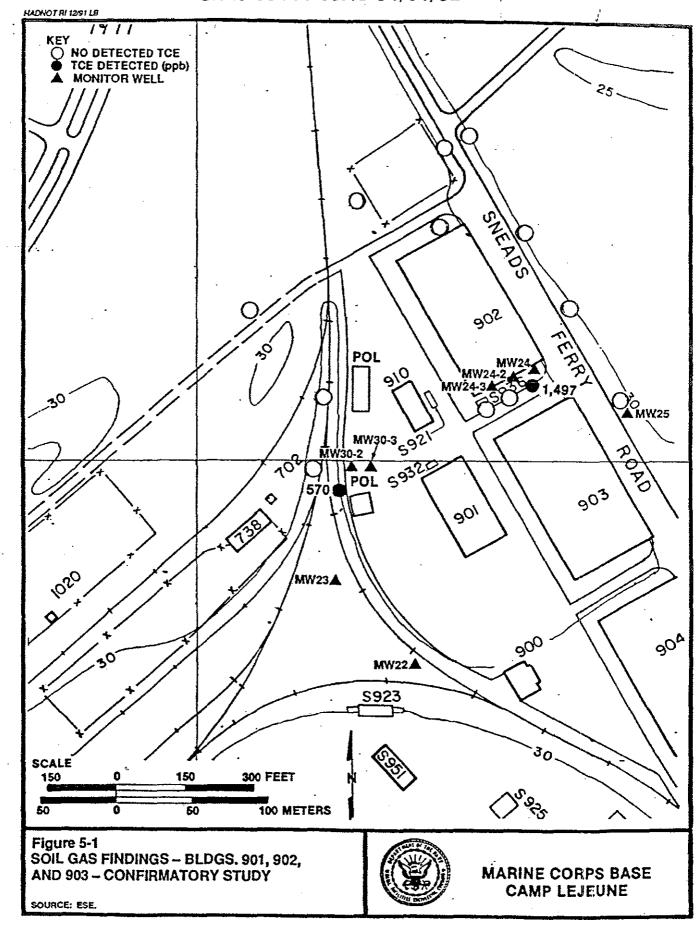
Additional inquiries conducted as part of the current Confirmation Study reconfirmed the presence of the underground tank adjacent to the eastern side of Bldg. 901; it remains in-place but is reportedly empty and/or filled with sand.

The documented presence of the underground tank and the use of TCE strongly indicated that a soil gas investigation should be conducted in the area between Bldgs. 902 and 903. Subsequent conversations, during the well drilling phase of the field efforts, with active Marine Corps staff working in the vicinity of Bldgs. 901, 902, and 903 indicated that degreasing of engines took place over a large area between Bldgs. 902 and 903 and the railroad lines.

The results of the soil gas investigation (Figure 5-1) identified the presence of TCE vapors in the soil column in the vicinity of the underground tank, verifying the records search data.

Bldg, 1100

This building was a small service station when it was first constructed (1943). It was most recently used as a printing plant. An empty drum labeled as 1,1,2,2-tetrachloroethane was found adjacent to the building at the time of the investigation. The field staff was verbally informed that this drum had developed a leak and was placed outside; the contents of the drum drained onto the ground. A single value of TCE was detected to the west of Bldg. 1100, although two samples obtained to the



APPENDIX F.3 BUILDING HP902 SOIL BORINGS (ESE, APRIL 1992)

5.2.2 Soil Borings

A total of 30 shallow soil borings were performed at HPIA at Camp Lejeune in January, 1991. The objective of the soil sampling program was to evaluate the extent of shallow (above the water table) soil contamination in three areas of concern at HPIA. These areas are located in the vicinity of Buildings 1601, 902, and 1202. Figures 3-1, 3-2, and 3-3 show the approximate locations of the soil borings.

Each soil boring was advanced to the first encountered water, which varied depending on the boring location. Continuous split spoon sampling was conducted while vapor monitoring with an photoionization detector (PID). Three samples were selected from each boring for chemical analysis, based upon the three highest readings of organic vapor levels recorded. In cases where the PID recorded levels of organic vapors equivalent to background atmospheric concentrations, samples were selected according to visual inspection for possible contamination. In the absence of any visible "contamination", the three samples were selected randomly. Where the water table proved to be too shallow to permit three different sampling intervals, samples were decreased in number accordingly.

A total of 96 soil samples were collected including nine duplicate samples. Nine of the analytical samples collected (including one duplicate sample) were analyzed for full Target Compound List (TCL) parameters. The remaining samples were analyzed for volatile organic compounds (TCL VOAs), pesticides and PCBs, and Toxicity Characteristic Leaching Procedure (TCLP) metals.

The analytical results presented in the following text are grouped according to study areas of interest. All soils data are presented in Appendix H. The significance of the analytical data will be discussed in the Risk Assessment for HPIA. A discussion of the QA/QC data including the blanks is presented in Appendix G.

Building 902

Soil borings HBSB-1 through HBSB-10 were completed in the vicinity of this building. Five of these borings were completed along or near the southeast wall where a buried TCE tank was reported during the record search. The locations of these soil borings is presented in Figure 3-1. Analytical hits for volatile, semi-volatile and pesticide compounds are presented in Table 5-1. Full soils analytical data are presented in Appendix H.

A total of 27 samples were collected and analyzed for volatile organic compounds. Four of these samples were collected in duplicate for QA purposes. Methylene chloride and Acetone were detected in 19 of these samples. These compounds were mainly reported as unquantifiable identified compounds (UIC) which were identified at concentrations below the certified reporting limit; or were also found in the accompanying analytical field blanks. Both these compounds are routinely used for laboratory analysis or glassware cleaning and are not chemicals used routinely at the HPIA. They therefore are assumed to be laboratory contaminants. Only one boring (HPSB-5) located near the reported TCE tank contained quantifiable concentrations of VOCs. The samples collected from the depths of 2 to 4 feet and 4 to 6 feet contained 1,2-dichloroethene (1,2-DCE) at concentrations of 55 mg/kg and 120 mg/kg) respectively. The sample collected from 4 to 6 feet also contained TCE (120 mg/kg). Other unquantifiable VOC's included chloromethane (HPSB-1), TCE (HPSB-4), 2-hexanone (HPSB-10) and toluene (HPSB-5).

The sample collected from the 0 to 2-foot depth of boring HPSB-6 contained quantifiable concentrations of phenanthrene (500 mg/kg), fluoranthene (690 mg/kg), and pyrene (530 mg/kg). Other unquantifiable UICs were identified in this sample and the sample collected from 0 to 2 feet in boring HPSB-1. As these were the only samples in this area analyzed for the full TCL parameters, the horizontal and vertical extent of soil contamination cannot be readily defined for these parameters.

No pesticide compounds were detected in any samples collected from this area. Select metals (aluminum, calcium, and iron) were abundant in all three soil samples analyzed in concentrations greater than 1,000 mg/kg. Many of the other metals analyzed for were also detected, but were detected in concentrations below the certified detection limits. TCLP analysis of 27 samples showed detectable quantities of virtually all analytes with the exception of mercury and silver, which were not detected in any sample. Those analytes which were detected typically were detected in concentrations below the certified detection limit.

Building 1202

Soil borings HBSB-11 through HBSB-20 were completed in the vicinity of this building. The locations of these soil borings is presented in Figure 3-2, analytical hits for volatile, semi-volatile and pesticide compounds are presented in Table 5-2. Full soils analytical data are presented in Appendix H.

A total of 32 samples were collected and analyzed for volatile organic compounds. Two of these samples were collected in duplicate for QA purposes. Methylene chloride and/or Acetone were detected in 29 of these samples. These compounds were mainly reported as UICs or were also found in the accompanying analytical field blanks. Both these compounds are routinely used for laboratory analysis or glassware cleaning and are not chemicals used routinely at the HPIA. They therefore are assumed to be laboratory contaminants. Only one boring (HPSB-14) located adjacent to building \$1122 across the street from building 1262 contained quantifiable concentrations of VOCs. The sample collected from the depths of 8 to 10 feet contained ethylbenzene (62 mg/kg) and xylene (580 mg/kg). Other unquantifiable VOC's included chlorobenzene (HPSB-11 [4-6 ft] and HPSB-13 [0-2 ft]) and TCE (HPSB-15 f0-2 ft] and HPSB-16 [0-2 ft and 8-10 ft]).

None of the three samples analyzed for semi-volatile compounds revealed any quantifiable concentrations. Unquantifiable UICs were identified in the three samples submitted.

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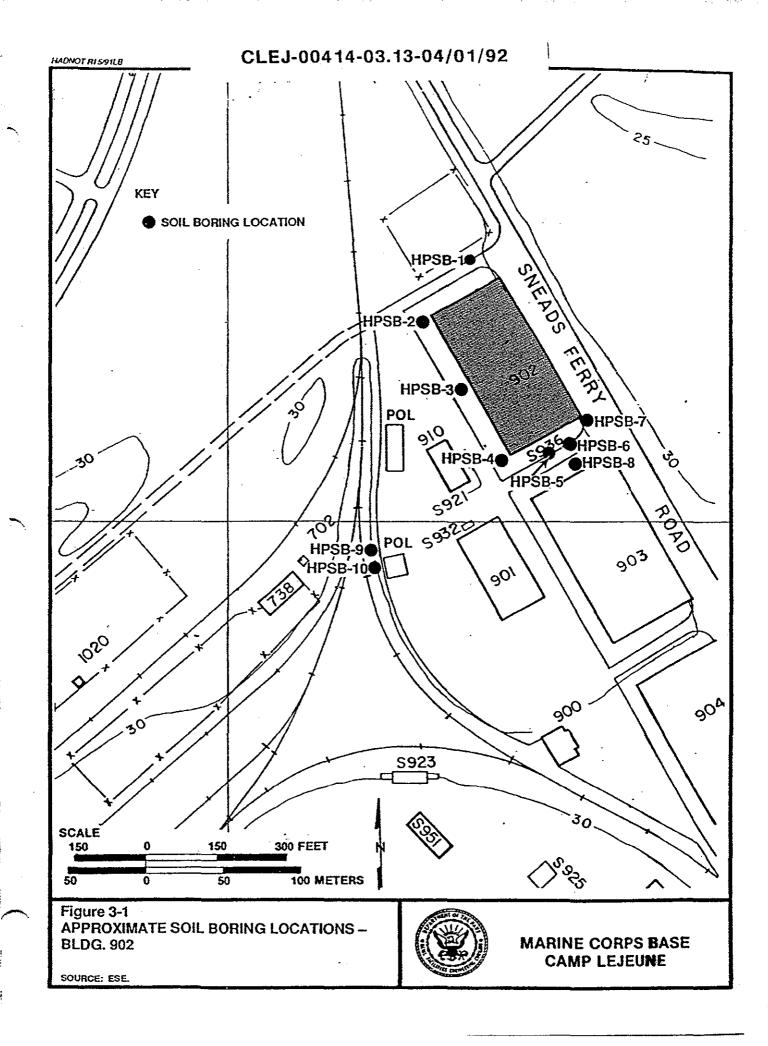


Table 5-1. Soil Sample Analytical Hits - Bldg 902 Area (pg 1 of 3)

		SB-1			SB-2 SB-3			SB-4						
		HPSO1-1	HPSO1-1D (HPSOD1)	HPSO1-2	HPSO1-3	HPSO2-1	HPSO2-2	HPSO2-2D (HPSOD2)	HPSO3-1	HPSO3-1D (HPSOD-3)	HPSO4-1	HPSO4-2	HPSO4-2D (HPSOD-4)	HPSO4-3
COMPOUND	depth:	0-2'	0-2'	2-4'	4-6'	0-2'	2-4'	2-4'	0-2'	0-2'	0-2'	2-4'	2-4'	4-6'
Chloromethane		11U	11U	110	1 1U	12U	11U	11U	110	11U	7BJ	9BJ	12U	11U
Methylene Chloride		1BJ	2BJ	1BJ	2BJ	2BJ	2BJ	2BJ	2BJ	2BJ	6U	6U	6U	en .
Acetone		8BJ	11U	9BJ	11U	18B	11U	11U	110	11U	5BJ	12U	778	54B
1,2-Dichloroethene (to	otal)	5U .	6U	6U	5U	6U	6U	6U	5U	5U	6U	6U	6U	6U
Trichloroethene		5U	6U	6U	5U	6U	6U	6U	5U	5U	6U	4J	6U	6U
2-Hexanone		110	11U	11U	11U	12U	11U	11U	11U	11U	110	12U	12U	11U
Toluene		5U	6U	6U	5U	6U	6U	6U	5U	5U .	6U	вU	6U	6U
Acenaphthylene		370U	3700	NA	NA	NA	NA .	NA .	NA	NA	NA	NA	NA	NA
Fluorene		370U	370U	NA	NA	NA	NA	NA	NA	NA	NA .	NA	NA	NA
Phenanthrene		94J	290J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA 1
Anthracene		370U	67J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene		100J	360J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ругеле		943	320J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene		41J	100J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene		44J	110J	NA	NA .	NA	NA	NA	NA	NA	ÑΑ	NA .	NA	NA
Benzo(b)fluoranthene	1	39J	59J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k) fluoranthene	l	48JX	82JX	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a) pyrene		370U	65J .	ΝA	NA	NA	NA	·NA	NA	NA	NA	NA	NA	.NA
ndeno (1,2,3-cd) pyrer	ne	370U	37J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,l)perylene		370U	370U	NA	NA	NA	NA	NA	NA	NA	NA	NA -	NA	NA

Note: All concentrations ug/kg

Volatile, semivolatile and pesticide compounds only

NA = Not Analyzed

U = Not detected (Detection limit)

J = Unquantifiable Identified compound

B = Detected also in associated blank

Source: ESE, 1992

Table 5-1. Soil Sample Analytical Hits - Bidg 902 Area (pg 2 of 3)

			SB-5			SB-6			SB-7			\$B-8	
		HPSO5-1	HPSO5-2	HPSO5-3	HPSO6-1	HPSO6-2	HPSO6-3	HPSO7-1	HPS07-2	HPS07-3	HPSO8-1	HPSO8-2	HP\$08-3
COMPOUND	depth:	0-2'	2-4'	4-6'	0-2'	2-4*	4-6'	0-2'	2-4'	4-6'	0-2'	2-4'	4-6'
Chloromethane		11U	12U	12U	11U	12U	12U	11U	11U	12U	12U	11U	11U
Methylene Chloride		6U	6U	6U	6U	6 U	6U	2BJ	4BJ	2BJ	2BJ	6U	2BJ
Acetone		1 1U	12U	4BJ	21B	35	138	27B	238	15B	12U	11U	6J
1,2-Dichloroethene (to	ital)	6U	55 1	20	6U	6U	6U	6U	6U .	. Ua	6U	6U	6U
Trichloroethene		6U	6U 🥰	20 >	6U	6U	6U	6U	6U	6U	6U	6U	6U
2-Hexanone		11U	120	12U	11U	12U	12U	11U	11U	12U	12U	110	11U
Toluene		6U	10	4J	6U	6U	6U	6U	6U	6U	6U	6U	6U
Acenaphthylene		NA	NA	NA	350U	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene		NA	NA	NA	48J ·	NA	NA	NA	NA	NA	NA	· NA	NA
Phenanthrene		NA	NA	NA	500	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	٠	NA	NA	NA	180J	NA	NA	NA	NA	NA	NA	NA	NA NA
Fluoranthene		NA	NA	NA	690	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene		NA	NA	NA	530	NA	NA	NA	, NA	NA	NA	NA	NA
Benzo(a)anthracene		NA	NA	NA	280J	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene		NA	NA	. NA	260J	NA.	NA	NA	NA	NA	NA	NA ·	NA
3enzo(b) fluoranthene		NA	NA	NA	250J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene		NA	NA	NA	210J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene		NA	NA	NA	240J	NA	NA	NA	NA	NA	NA	NA	NA
ndeno(1,2,3-cd)pyren	o	NA	NA	NA	130J	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene		NA	NA	NA	110J	NA	NA	NA	NA	NA	NA	NA	NA

Note: All concentrations ug/kg

Volatile, semivolatile and pesticide compounds only

NA = Not Analyzed

U = Not detected (Detection limit)

J = Unquantifiable identified compound

B = Detected also in associated blank

Source: ESE, 1992

Table 5-1. Soil Sample Analytical Hits - Bldg 902 Area (pg 3 of 3)

			\$8-9			SB-10	
		HPSO9-1	HPSO9-2	HPSO9-3	HPSO10-1	HPSO10-2	HPSO10-3
COMPOUND	depth:	0-2'	2-4'	4-6'	0-2'	2-4'	4-6'
Chloromethane	<u></u>	110	11U	12U	12U	12U	12U
Methylene Chloride		6U	2BJ	2BJ	28J	2BJ	38J
Acetone		6J	20	13	5J	9 J	12U
1,2-Dichloroethene (tota	al)	6U .	6U	6U	6U	6U	6U
Trichloroethene		6U	6U	6U	6U	6U	6U
2-Hexanone		11U	11U	12U	12U	12U	1J
Toluene		6 U	6U	6U	6U	6U	6U
Acenaphthylene		NA	NA	NA	380U	NA	NA
Fluorene		NA	NA	NA	380U	NA	NA
Phenanthrene		NA	NA	NA	380U	NA	NA
Anthracene		NA	NA	NA	380U	NA	NA
Fluoranthene		NA	NA	NA	380U	NA	NA
Pyrene		NA	NA	NA	380U	NA	NA
Benzo(a) anthracene		NA	NA	NA	380U	NA	NA
Chrysene	•	NA	NA	NA	380U	NA	NA
Benzo(b) fluoranthene		NA	NA	NA	380U	NA	NA .
Benzo(k) fluoranthene		NA	NA	NA	380U	NA	NA
Benzo(a)pyrene		NA	NA	NA	380U	NA	NA
Indeno(1,2,3-cd)pyrene	,	NA	NA	NA	380U	NA	NA
Benzo(g,h,i)perylene		NA	NA	NA	380U	NA	NA

Note: All concentrations ug/kg

Volatile, semivolatile and pesticide compounds only

NA = Not Analyzed

U = Not detected (Detection limit)

J = Unquantifiable Identified compound

B = Detected also in associated blank

Source: ESE, 1992

CAMP LEJEUNE - HPIA INORGANICS IN SOIL SAMPLES Concentration in mg/kg

•			\$8-1	\$8-6	\$8+10	
		4444444		********		
		HPS01-1	HPSO1-1D	HP\$06-1	HPS010-1	
			(HPS00-1)			
METAL/COMPOUND	depth:	0-2'	0-2'	0-2'	0-2'	
.luminum	***********	3590.00	4140,00	3400.00	3920.00	
Antimony		5.40UN	5.90BN	7.40BN	9.60BN	
rsenic		0.558	0.508	0.66B	0.578	
arium		6,008	6.108	6,00B	19.608	
eryllium		0.200	0.160	0.170	0.19U	1 3
admium		0.808	0.470	1.70	0.94	
alcium		1450.00	1660.00	4410.00	1830.00	
hromium	÷	5.00	5.00	4.10	11.80	1 3 35-4
obalt		1.408	0.93B	1.408	1.708	3-24-
opper		1.40B	1.108	1.00B	4.90	
ron		1790.00E	2030.00E	1790.00E	2020.00E	1:75-51.6
ead		2,40K*	3.70N*S	3.20x*	56.90N*S	1222
agnesium		128,008	116.008	134.00B	121.00B	1,799/13
anganese		3.80	2.50	2.90	7.70	
ercury		0.110	0.090	0.100	0.090	0 M
ickel		2,60B	1.70B	1.708	2.808	[[] []
otassium		124.00B	127.00B	113.00B	155.00B	1 (2) >
elenium		0.160	0.21BW	0.398W	0.45B	BY BY
ilver		0.800	0.62U	0.690	1.108	1 ' 🔼
odium		120.00B	297.008	92.20B	121.00B	PROJECT PREPARED DATE CHECKED E
hatlfum		0.16UN	0.17UW	0.18UW	0.19UN	D B B C
anadium		5.208	6.108	4.60B	5.30B	_
inc		0.808	1.408	1.20B	32.30	
Cyanide		0.690	0.690	0.700	0.700	

CAMP LEJEUNE - HPIA TCLP METALS IN SOIL SAMPLES Concentration in ug/l

CHART = SOIL-T1

			SB~1		\$8-2			\$B-3
		KPS01-2	HPS01-3	HP\$02-1	HPS02-2	HPSO2-2D (HPSOD-2)	HPS03-1	нрsо3-10 (нрsо0-3)
TCLP METALS	depth:	2-4'	4-61	0-2*	2-47	2-4	0-2'	0-21
Arsenic		112.00B	785,00B	100.00B	75.00B	112.00B	75.00B	92.00B
Barium .		334.00	201.00	153.008	255.00	584.00	382.00	244.00
Cadmium		5.00B	3.000	6.008	4.00B	3.00B	27.00	15.00
hromium		5.00B	6.008	5.00B	3.008	6.00B	5.008	4,00B
ead .	•	56.008	56.00B	41.008	69.00B	54.00B	79.00B	47.00B
lercury		0.200	0.200	0.200	0.200	0.200	0.200	0.200
elenium		121.00BN	530.008N	65.00BN	110.008N	63.00UN	76.00BN	100.00BH
Silver		4.000	4.00u	4.000	4.000	4.000	4.000	4.000

PROJECT Gamp Lejeune
PREPARED BY EC Knyfel

DATE 5/9/
CHICAGO BY ALL LICENAL

CAMP LEJEUNE - HPIA TCLP METALS IN SOIL SAMPLES Concentration in ug/l

CH	۵	RT	=	SO	11 -	12

				SB-4			SB • 5	
		******	****		нрѕо4-3	NPS05-1	HPS05-2	HPS05-3
		HPS04-1	HPS04-2	HPSO4 • 20 (HPSO0 • 4)	лР504-3	n2503-1	BFSGJ-Z	מ-נטט-ח
TCLP METALS	depth:	0-2'	2-41	2-4'	4-61	0-21	2-41	4-61
Arsenic		161.00B	111,00B	101.008	95.00B	86.008	122.00B	120.00B
Barium		306.00	188.00B	166.00B	240.00	210.00	277.00	231.00
Cadmium		10.00	3,008	3.00B	3.000	3.00B	3.00U	3.00U
Chromium		7.00B	5.00B	4.00B	4.00B	5.00B	6.00B	4.00B
Lead		57.00B	53.00B	50.008	70.00B	65.00B	53.00B	48.00B
Mercury		0.200	0.200	0.20U	0.20U	0.200	0.200	0.200
Selenium		75.008N	89.00BN	168.008N	130.00BN	63,00UN	63.00UN	113.00BN
Silver		4.00U	4,000	4.000	4.000	4.00U	4.00U	4.000

PROJECT Camp Rejeund

PREPARED BY 5/91

CHECKED BY JUNE SUMME

DATE 5-22-91

£. 112+#

CAMP LEJEUNE - HPIA TCLP METALS IN SOIL SAMPLES Concentration in ug/(

CHA	OT	 SO	11	- 1	7

**********			S8-6		sa-7	******
********		HP\$06-2	HPS06-3	HPS07-1	HPS07-2	HPS07-3
TCLP METALS	depth:	2-41	4-61	0-21	2-41	4-61
Arsenic		128.00B	40.000	90.008	48.00B	109.00B
Barium		191.00В	207.00	191.008	158.00B	186.00B
Çadmium		3.008	7.00B	8.00B	3.00U	9.00B
Chromium		3.00B	5,00B	3.008	3,00B	4.00B
Lead		47.00B	45.00B	44.00B	45.00B	44.00B
Mercury		0.200	0.200	0.200	0.20U	0.200
Selenium		63.00UN	63.00UN	147.00BN	75.00BN	63.00UN
Silver		4.000	5.00B	4.00U	4.00U	4.000

PROJECT Samp Rojectie
FREPARED BY ED Rings

DATE 5/91

OTTO DY DUBLI HUMA

5-20-41

CAMP LEJEUNE - HPIA PESTICIDES IN SOIL SAMPLES Concentration in ug/kg

CHART = SOIL-P1

				\$B-1			\$8-2	
		HPS01-1	KPSO1-1D (HPSO0-1)	KP\$01-2	нрѕо1-3	HPS02-1	HPS02-2	HPSO2-2D (HPSO0-2)
ESTICIDE/PCB	depth:	0-24	0-2'	2-4*	4-6'	0-21	2-41	2-41
ipha-BHC		9.00	8.90	9.20	9.20	8.90	9.3U	9.5U
eta-BHC		9.00	8.9U	9.20	9.20	8.90	9.3u	9.5u
elta-BHC		9.00	8.90	9.20	9.20	8.90	9.3U	9.5บ
amma-BHC (Lindane)		9.00	8.90	9.20	9.20	8.90	9.3U	9.50
eptachlor		9.00	8.90	9.20	9.2U	8.90	9.3U	9.5U
drin		9.00	8.90	9.20	9.20	8.90	9.3U	9.50
ptachlor epoxide		9.0U	8.90	9.20	9.2U	8.90	9.3U	9.5U
dosulfan I		9.00	8.90	9.20	9.20	8.90	9.3U	9.50
eldrin		180	180	180	180	18U	190	19U
4'-DDE		180	18U	18U	180	180	. 19U	19U
drin		180	180	180	180	180	190	190
dosulfan II		180	180	18U	180	180	19U	19u
47-000		180	180	180	180	180	19U	19U
dosulfan sulfate		180	180	180	18U	18U	190	19U
4'-DDT		18U	18U	180	180	180	190	190
thoxychlor		90U	89Ü	92U	92U	89U	93U	95U
drin ketone		180	180	180	180	180	190	19U
pha-Chlordane		900	890	920	9 2U	89U	9 3 U	95 u
mma-Chlordane		900	89U	92U	92 U	89U	93U	95u
xaphene		1800	1800	1800	180U	180U	190u	1900
octor-1016		900	890	92U	920	89U	93u	95U
octor-1221		900	89U	92U	920	890	93U	95U
octor-1232		90u	89U	92U	920	89ú	930	95U
octor-1242		900	89U	92U	920	89U	93U	95U
octor-1248		90U	890	92U	92U	89U	930	95U
octor-1254		180u	180u	1800	1800	1800	1900	190U
octor-1260		180U	1800	1800	180U	180U	190U	1900

CAMP LEJEUNE-HPIA PESTICIDES IN SOIL SAMPLES Concentration in ug/kg

CHART = SOIL-P2

			SB-3		SB	4	
		HPS03-1	HPS03-1D (HPS00-3)	к Р \$04 - 1	HPS04-2	HPSO4-2D (HPSO0-4)	HPS04-3
PESTICIDE/PCB	depth:	0-2'	0-2'	0-2'	2-41	2-41	4-6'
atpha-BHC		8,90	9.0U	8.90	9.0U	9.30	9.4U
ceta-8HC	•	8.9U	9.0u	8.90	9.0U	9.30	9.40
ielta-BHC		8.90	9.0U	8.90	9.0U	9.30	9.40
gamma-BKC (Lindane)		8.9U	9.00	8,90	9.00	9.30	9,40
leptachlor		8.90	9.00	8.90	9.00	9.30	9.40
lldrin		8.90	9.00	8.90	9.00	9.30	9.40
eptachlor epoxide		8,90	9.00	8.9U	9.00	9.30	9,40
indosulfan I		8.90	9.00	8,90	9.00	9.30	9.40
ieldrin		18U	180	180	180	190	19U
,4'-DDE		180	18U	18 U	180	19U	19U
indrîn		18U	180	18U	180	190	19U
indosulfan II		18U	180	180	180	190	19U
:4*-000		180	180	180	180	190	19U
ndosulfan sulfate		180	180	180	180	190	19U
,44-DDT		18U	180	18U	180	190	19U
ethoxychlor		89U	900	89U	90U	930	94U
ndrin ketone		18U	180	180	180	190	19U
ipha-Chiordane		89U	90U	89U	900	93U	944
amma-Chlordane		89U	900	89U	90U	930	940
oxaphene		180U	1800	180U	1800	1900	1900
roclor-1016		89U	900	890	900	93U	940
roctor-1221		89U	90U 1	890	900	93 U	940
roclor-1232		89U	900	890	90U	93U	940
roclor-1242		890	90U ·	89U	90U	93U	940
rocior-1248		89U _	900	89U	90U	93U	944
roctor-1254		180u	180U	180U	180U	190U	1900
roctor-1260		1800	180u	1800	1800	190U	190U

CAMP LEJEUNE - HPIA
PESTICIDES IN SOIL SAMPLES
Concentration in ug/kg

CHART = SOIL-P3

Aroclor-1260

1800

1900

190U

sy\wp8d\base-

CHAKI = SUIL-P3								sy/wpod/base.
			\$8-5			SB-6		
		HPS05-1	HPS05-2	нрѕо5-3	KP\$06-1	HP\$06-2	HP\$06-3	•
PESTICIDE/PCB	depth:	0-21	2-4'	4-61	0-2'	2-4'	4-61	
ilpha-BHC		9.QU	9.3U	9.40	9.00	9.0U	9.50	
beta-8KC		9.00	9.30	9.40	9.00	9.0U	9.50	
delta-BHC		9.00	9.30	9.4U	9.00	9.04	9.50	
jamma-BHC (Lindane)		9.00	9.30	9.40	9.00	9.00	9.50	• • • •
leptachlor	•	9.00	9.30	9.40	9.00	9.00	9.50	
lldrin		9.0U	9.30	9.40	9.00	9.00	9.5U	
eptachlor epoxide		9.00	9.30	9.40	9.0U	9.00	9.5U	ا أو
ndosulfan 1		9.00	9.30	9.40	9.0U	9.0U	9.50	" 4
[eldrin		18U	190	190	18U	180	190	
,4'-DDE		180	19U	190	180	180	190 -	\A". \I
ndrin		180	19U	190	180	18U	19U	1
ndosulfan II		18U	190	190	180	180	190	(12 / LI
,41-DDD		180	19U	190	180	180	19U	
ndosulfan sulfate		180	19U	19U	180	180	19U	1 N. W.
,4/-DDT		180	19U	190	18U	184	19U	
ethoxychlor		90 U	93U	940	90U	90U	95ช	털
ndrin ketone		180	19U	190	181	180	190	८५ ।
lpha-Chlordane		900	93U	940	900	90u	95u -	\exists
amma-Chlordane		900	9 3 U	940	90U	90U	95U	1
oxaphene		180u	190U	190U	180U	180U	190U	ς:
roctor-1916		90U	93U	940	· 90U	900	950	
roclar-1221		90U	93U	9 40	900	900	95U	į
roctor-1232		9 0 U	93U	94U	904	90U	95U	ţ
roctor-1242		90U	93U	94U	90U	90u	950	(
roctor-1248		900	93U	940	900	90u	95U	
roctor-1254		180U	1900	1900	180U	180U	1900	

180U

180U

190U

CCMENTS

1900

180U

1900

CAMP LEJEUNE • HPIA PESTICIDES IN SOIL SAMPLES Concentration in ug/kg

HART = SOIL-P4								sy\wp8d\base-
		****	SB-7			sa-8		
		HPS07-1	HPS07-2	HPS07-3	HPS08-1	HPS08-2	нР\$08-3	
STICIDE/PCB	depth:	0-2'	2-4'	4-61	Q-2 <i>*</i>	2-41	4-61	
lpha-BHC	*******	9.00	9.0U	100	9.40	9.10	9.5U	
ta-BHC		9.00	9.00	10U	9.40	9.10	9.5U	
elta-BHC		9.00	9.00	10U	9.40	9.10	9.50	
mma-BHC (Lindane)	9.00	9.00	100	9.40	9.1U	9.50	
eptachlor	•	9.00	9.00	100	9.40	9.10	9.50	
drin		9.00	9,0U	10U	9.40	9.10	9.50	1 1
ptachlor epoxide	•	9.00	9.00	100	9.40	9.10	9.50	
dosulfan I	•	9.00	9.00	10u	9.40	9.10	9.50	
eldrin	4	18 U	180	200	1 <i>9</i> U	180	19U	o do do
4'-DDE		180	18U	20U	190	180	19U	\ \dagger{\partial \text{3}}
drin		180	180	200	19U	18U	19U	' せご
dosulfan II		18U	18U	200	190	180	19U	
4/-000		180	18U	20U	1 9 U	18U	19U	14 L
dosulfan sulfate	•	180	180	200	19U	180	19U	Color Color
'-DDT		180	18U	200	190	180	19U	J. 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
thoxychlor		90U	90U	100U	940	91u	95U	
drin ketone		180	180	200	190	181	-19U	34
pha-Chlordane		900	90U	1000	94 U	91U	95U	
mma-Chlordane		90U	900	100u	94U	910	950	,
xaphene		1800	1800	2000	190U	180U	190U	PROJECT
octor-1016		90u	90u	1000	94U	91u	95U	
octor-1221		900	900	1000	944	910	95U	RC
octor-1232	1	90U	900	100U	940	910	95U	F
octor-1242		90U	900	1000	940	91u	95U	
octor-1248		900	900	100U	940	910	95U '-	
roctor+1254		1800	180U	2000	1900	180U	1900	
		4004	4.44	2001	100:1	4001	1000	

1800

180U

Aroctor-1260

200U

CLEJ-00414-03.13-04/01/92 BORING NO. HPSB I Project Name Camp Lejeune Hadnot Point Soil Borings Project No. 4902036 Page _ Driller Environmental Contractor ESE, Inc. 1-8-91 Date started completed 1-8-91 Casing Size Method HSA HNU 11.7/10.2 Protection Level D ¥ 29.5 below ground Total Depth (Off Ground El. Soil Drilled Logged by Paul M. Feinberg Checked by Date

Sample	Depth in	Blows	Pan.		HNU	Comments on	Monit	Ю
No.	Feet	per 6	Rec.	Description		Advance of Boring	HNU	L
#1	0'-2'	6-8	24/23	[SAT] F-m sitty send, tt. stems Upper 17" orangeg gray ton Lower 6" light gray brown Lower 6" l	EG	Background (80) HNU: 2.8 ppm The sample was taken at 0919 material		,
#2	2'-4'	3-15	2.4	[EM] upper 8" stained block midle 5" light gray Lexest 7" orangy tan	36	B6 HNU = 2.4 ppm Sample time = 0932		<
#3	4'-6'	5-4 4-5	24	[SM] Upper 7" stained black Lower 12" orangey tan-cah	β6 5:ν ε	Sample time = 0950		
	6'-8'	3-5 7-8	24	EM] Light orengey gray ton	B6	Bo HNU = 2.2 ppm Sample time 1005		
	8'-10'	4-2 j-3	24 16	SM] upper 5" light growy brown middle 7" light orangey-yellow lower 4" orange tan 6" gray tan. Boring terminated at 10		BG HNU= 2.2 ppm Sample time 10:5 Water Table & 92'		

F .	CLEJ-00414-03.13-		BORING NO. HPSB2			
Project No. 4902036	Project Name Camplejou	ne Hadust Point Soil	Borilys	Page _/_of_/		
Contractor ESE, Inc.	Driller Manthon (Testing	Date started 1-8-	91 a	ompleted 1-2-91		
Method HSA	Casing Size	HNU 11.7/10.2	Prote	ction Level D		
Ground El.	Soil Drilled	¥ <u>~3'</u> below groun	d Total	Depth 4ff		
Logged by Faul M. Femberg	Checked by	Date				

No. Feet per 6 Rec. Description Advance of Boring	Monitori	Comments on	HNU		Pan.	Blows	Depth in	Sample
H2 2'-4' 4-2 24 Peat/[SC] Upper3" med. B6 Sample time: 1430 gray (dense in spits) Lower 21" binepay Water Table 23'	HNU LE	Advance of Boring	1 1		Rec.	per 6 *	Feet	No.
1-3 24 Peat/[SC] Upper3" med. B6 Sample time: 1430 gray (dense in spits) Lawer 21" binegry Water Table 23'	0	Bockground (BG) HNU = 2.2 pp.n Sample time = 1420	t 186	Upper 16" [SM] uppertt" light well-brann Lower 3" peat Lower 3" black (stained)	24/19		0'-2'	# }
Boring terminated at 4'			: B6	peat/[SC] upper3" med.	24/24		2'-4'	#2
				Boring terminated at 4'				
		,	·					
				·			,	-

BORING NO. HPSBS Project Name Camp Lejeune Hadnot Point Soil Borings Project No. 4902036 Page . Driller Newtony of Festing completed 1-7-91 Date started Contractor ESE, Inc. Protection Level \supset Method HSA Casing Size HNU 11.7/10.2 Soil Drilled ▼ <u>*1.5</u> below ground Total Depth Ground El. Logged by Paul M. Feinberg Checked by Date

Sample	Depth in	Blows	Pen.	•	HNU	Comments on	Mon	itori
No.	F ac t	per 6	Rec.	Description		Advance of Boring	нии	LE
		per 6* 9 - 10 11 - 13	24/18	Description [SM] gray & light gray Note: upper 5th is dock brown to mark - Black may be and to staining Boring terminated at 2!	T 4	Advance of Boring Bockground (BG) HNU=2.51fm Sample time = 1545 Water Table & 1½'	HAND	

BORING NO. HPSR4 Project Name Comp Lejeure Hadnot Point Soil Boings Page_ Project No. 4902036 Driller Environmental Date started 1-9-91 Contractor ESE, Inc. completed 1-9-91 Method HSA HNU 11.7/10.2 Casing Size Protection Level ▼ <u>~ 4 '</u> below ground Total Depth 10f+ Ground El. Soil Drilled Logged by Paul M. Kinberg Checked by Date

Sample No.			Pen.	1 .	HNU	Comments on	1	ibda
140.	Feet	per 6	Rec.	Description		Advance of Boring	HNU	LE
#	0'-2'	13-11 9-7.	24	Upper 7" [SC] dark brown/black Lower 10' [GM] light brown	BE-	Background (BG) HNU=3.2ppm Sample time = 0.750		
#2	2'-4'	4-2 3-1	24	Upper 4" [SM] gray brown M: Liv 4" [Cw] stained black Lawer 12" [CL] light gray w/some wisp of	i "	Sample time = 0757 Water Table @ & 4'		
#3	4'-6'	4·2. 1 <u>-</u> 1 <u>2</u> "	24	[CL] light gray	BG	B6 = 3.0 ppm Sample Time = 0905		
	6'-8'	10-12 15-14	24 19t	[SM] light gray	BG	BG≈Z. *ppm Sample Time = 084Z		
	₹′-10′	6-6 12-15	24	[SM] light blue gray	B G	86 = 3.0 ppm Sample Time - 0800		0
	Bos	ing T	Ermin	ated at 10'				
			; ;					
							-	
				•				
								: ; !

BORING NO. HPSES Project No. 490 2 0 3 6 Project Name Camp Lyone Hadnet Point Soil Berings Page _ /_ of _ / Contractor ESE, Inc. Date started completed 1-7-91 Protection Level D Method HSA Casing Size HNU 11.7/10.2 Ground El. Soil Drilled ¥~51 below ground Total Depth 6ft Checked by Logged by Paul M Kinhera Date

Sample	Depth in	Blows Pen.			HNU	Comments on		mar
No.	Feet	per 6 *	Rec.	Description		Advance of Soring	HNU	LE
#1	0'-2'	5-7 10-12	24/23	Upper 7" topsell middle 3" [SM] stained black Lower 13" [SM] taneigray tan	BG	Background (BG) HNU= 2.6ppm Somple time = 1036hrs		
#2	2-4'	12-19 10-11	15	Upper 7" [SM] light grays'tan Lower 8" wood chunk orange but stamed black	Юфрт	Sample time = 1050 hrs		
#3	4'-6'	4-7 3-8		[SM] light gray w/some partions apparently stained black. coines ve g terminated at 6'.	5.811~	Sample-time = 1105 Water-Tuble @ ≈ 5'		
				•				
				·				
				-				

BORING NO. HTSB 6 Project No. 4902036 Page _/_ of _/ Project Name (ano Date started 1-9-91 completed 1-9-91 Contractor ESE, Inc. HNU 11,7/10.2 Protection Level \mathcal{D} Casing Size Method HSA ¥ <u>~4'</u> below ground Total Depth 6ft Soil Drilled Ground El. Logged by Paul M. Feinberg Checked by Date

Sample	Depth in	Blows	Pen.		HNU	Comments on	Mon	itori
No.	Feet	per 6	Rec.	Description		Advence of Soring	НИО	LE
#!	0'-2'	12-10	24 22	[SM] Light brown of light gray In lower 8". Note: Top 4" of sample is Stained black.	B6-	,		
#2	2'-4'	4-4	24	Upper 7" [SM] gray Lower 14" [SC] light gray stan	BG	Rackground (BG) = 3.2 ppm Sample time 1s 1319 Water Table @ R 4'		
 #3	4'-6'	C-1 1-4	1 1	Upper 4" [SM] medium gray & black Middle 16 [EQ] ight tan + light gray Lower 4" [SM] Light gray		Background (BG) = 3.4 ppm Sample time is 1329		
			ŧ i	g terminated at 6'				
						·	-	
						·		

CLEJ-00414-03.13-04/01/92 BORING NO. HESR 7 Project No. 4902036 Project Name Camp Liger Hadnot Point Soil Boings Page | of | Date started completed 1-9-91 Contractor ESE, Inc. HNU 11.7/10.2 Casing Size Protection Level D Method HSA Soil Drilled ▼ <u>~4'</u> below ground Total Depth 6ft Ground El. Logged by Paul M. Femberz Checked by Date

Sample	Depth in	Blows	Pen.		HNU	Comments on	Mar	nitori
No.	Feet	per 6	Rec.	Description		Advance of Boring	HNC	J LE
#1	0'-2'	9-7 7-5	24 19	[SM] tan - lower 3" is stained black	86	Background (86) = 2.6 ppm Sample time is 1357		
#2.	2'-4'	6-5		Upper 10" [SM] medigray & black Lower 7" [SC] lightgray	4.2 m	Water Table @ 241		O
#3	4'-6'	2.2	2 <u>u</u> ≈17	Upper 10" [SC] tan Lower 7" [SC] light gray - some dark gray to black coloration	Z 6	Background (BG) = 3.0 ppm Sample time is 1430		
			Pori	g terminated at 6'				
·								
				·				
	•		·			•		
				•				
				: 1		5		
				·				
						•		

BORING NO. HPSB 8 י בילו בינווו וילו בילו Project Name Camp Lejene Hadnet Print Seil Boings Page <u>1</u> of <u>1</u> Project No. 4902036 Driller Lavier completed 1-9-9 Date started 1-9-91 ESE, Inc. Contractor Protection Level D HNU 11,7/10.2 Casing Size Method HSA ¥~41 below ground Soil Drilled Total Depth Ground El. 69+ Logged by Paul M. Kinberry Checked by Date

Sample	Depth in	Blows	Pen.		HNU	Comments on	Mar	itor
No.	Feet	per 6 *	Rec.	Description		Advence of Boring	HNL	Ju
#	0'-2'	4-4 5-5	24	EM]/[ML] Lightbrown fran		Background (BE) = 3.4 ppin Sample time = 1549 hrs		0
#2	2'-4'	4-7	22	Upper II [SM] black Lower II " [ML] lightgray ; tan	BG	Background (56)=3.2ppm Sample time is 1555 hrs.		
#3	4'-6'	2-2	27/23	Hones 17" TCL Jarentun W	BG to st	Backgroud (BG) = 28ffm Sample time is 1603 km Water Table 224'		
				Boring Terminated at 6'				
				-				

APPENDIX F.4 BUILDING HP902 SOIL BORINGS (BAKER, 1994) Level D to Level C personal protection) were not required during the drilling and sampling program].

As described in Sections 2.3.3.1 and 2.3.3.2, two types of borings were installed during the investigation; exploratory borings (i.e., boring installed for sample collection only) and borings advanced for monitoring well installation. The sampling intervals and methods employed for soils collected at Site 78 were the same as those described for Sites 21 and 24. A summary of the boring numbers, boring depths, and sampling intervals is provided in Appendix G.

Each split-spoon sample was classified visually by the site geologist as described in Section 2.3.3.1. Lithologic descriptions of soils collected at Site 78 are provided on the Test Boring Records in Appendix E and the Test Boring and Well Construction Records in Appendix F.

Soil Sampling

Soil Sample Locations

As mentioned above, five main areas (Building 1608 included with 1601) of concern were identified at Site 78 based on the results of previous analytical data, the geophysical investigation, and Camp Lejeune historical records. Boring locations are shown on Figures 2-5A (Building 903), 2-5B (Buildings 1502, 1601, and 1608), 2-5C (Building 1103), and 2-5D (Building 1300). As shown on Figures 2-5A through 2-5D, approximately three borings were installed at each UST area, and approximately five borings per building were installed at Buildings 1103, 1300, and 1601 to assess PCB and/or pesticide contamination. Samples collected from boring 78-BB-SB (surface and subsurface) served as site-specific background samples.

Note that no additional borings were installed at any of the buildings investigated (per the Final RI/FS FSAP, if necessary) to further assess the extent of contamination because the "quick" turnaround samples did not exhibit excessive amounts of contamination. Additional borings for monitoring well installation, however, were installed based on the results of the soil gas survey and for the replacement of monitoring well 78GW09-1. These boring/monitoring wells are discussed in Section 2.3.4.3.

Soil Sampling Procedures

Surface and subsurface soil samples were obtained via a drill rig (i.e., split-spoon samples) or a hand auger as described in Sections 2.3.3.1 and 2.3.3.2. Typically, two samples per borehole were submitted for analysis. In some cases, a third sample from a borehole was also submitted for analysis if indications of contamination (i.e., elevated PID readings or visual contamination) were noted or if the boring was deeper than 10 feet. In general, samples retained for laboratory analysis were collected from the surface and just above the water table. A sample was also submitted from just below the water table at borings advanced for monitoring well installation (no surface sample submitted for these borings) so that groundwater results could be correlated with soil conditions. Soil samples retained for analysis were prepared and handled according to the procedures outlined on Sections 2.3.3.1 and 2.3.3.2 (same procedures as those described for Sites 21 and 24). A summary of the sample numbers, sample depths, and parameters analyzed is provided in Appendix G (G.3).

Analytical Program

The analytical program initiated for the soil investigation at Site 78 focused on the suspected contaminants of concern at each building. As mentioned previously, the contaminants of concern were identified from previous investigations. Samples from the suspected UST areas were analyzed for TCL volatiles; samples from Buildings 1103, 1601 (and 1608) were analyzed for TCL pesticides/herbicides; samples from Building 1300 were analyzed for TCL pesticides/herbicides and TCL PCBs; and samples collected during the installation of replacement monitoring well 78GW09-1 were analyzed for TCL volatiles. A summary of the boring numbers, sampling intervals, and parameters analyzed is provided in Appendix G (G.3).

In addition to analyzing for the contaminants of concern, two borings advanced at Building 903 to collect composite samples for chemical engineering parameters. These samples were analyzed for the same engineering parameters as those described in Section 2.3.3.1. The samples were collected to provide information for evaluating potential applicable treatment technologies, if required.

Metals exhibiting elevated concentrations included: arsenic (116 μ g/l), cadmium (5 to 12 μ g/l), chromium (78 to 316 μ g/l), lead (17.9 to 89 μ g/l), manganese (66 to 518 μ g/l), mercury (2.6 to 3.2 μ g/l) and nickel (140 μ g/l. These metals were also elevated in soils as discussed in Section 4.2.2.2. The source of the metals is believed to be related to the disposal of various metal debris and fly ash.

4.3.3 Site 78 Extent of Contamination

The following sections discuss the extent of contamination at Site 78 with respect to soil, groundwater, surface water, and sediment.

4.3.3.1 Extent of Soil Contamination at Site 78

As with the other two sites within OU No 1, the soils within Site 78 exhibited detectable levels of both organics and inorganics. Positive detections of organic compounds at Buildings 903, 1103, 1300, 1502, 1601, and 1608 are depicted on Figures 4-11 through 4-18 for surface and subsurface soils. Note that the inorganic results are not displayed on any figures due to the extensive list of detectable metals for each boring. A summary of the extent of contamination at each building area investigated during this RI is presented below.

Building 903

Analytical data indicated that organic compounds, (i.e., VOCs, SVOCs and pesticides) are the predominant contaminants impacting soils at Building 903. Accordingly, only the extent of these contaminants will be discussed for this site.

Volatiles

VOCs were not detected in any surface soil samples collected at Building 903. Low concentrations (16 µg/kg or less) of 1,2-DCE were detected in subsurface soils collected from borings 78B903SB02 (5 to 6 feet) and 78B903SB03 (4 to 5 feet). These borings are located along the northern and southern corners of the tank as shown on Figure 4-12. The source of the 1,2-DCE may be related to historical spills at the tank or solvent usage at the building.

Semivolatiles

SVOCs were detected in all three surface samples collected around the UST area but in only one of the subsurface samples. Borings 78B903SB01 and 78B903SB03 exhibited the most detections of SVOCs. The concentration ranges of a few SVOCs detected in the surface soils included: naphthalene (81 J to 1,400 µg/kg); phenanthrene (770 to 9,000 µg/kg); fluoranthene (2,100 to 8,800 µg/kg); and pyrene (1,500 to 7,600 µg/kg). Subsurface soils indicated significantly lower SVOC (Table 4-26) concentrations with few detections compared to surface soils. A sample collected from 4 to 5 feet at 78B903SB02 was the only boring which exhibited SVOCs (concentrations ranged from 74 to 590 µg/kg). The potential source of the SVOCs may be related to releases of fuel in the area.

Pesticides

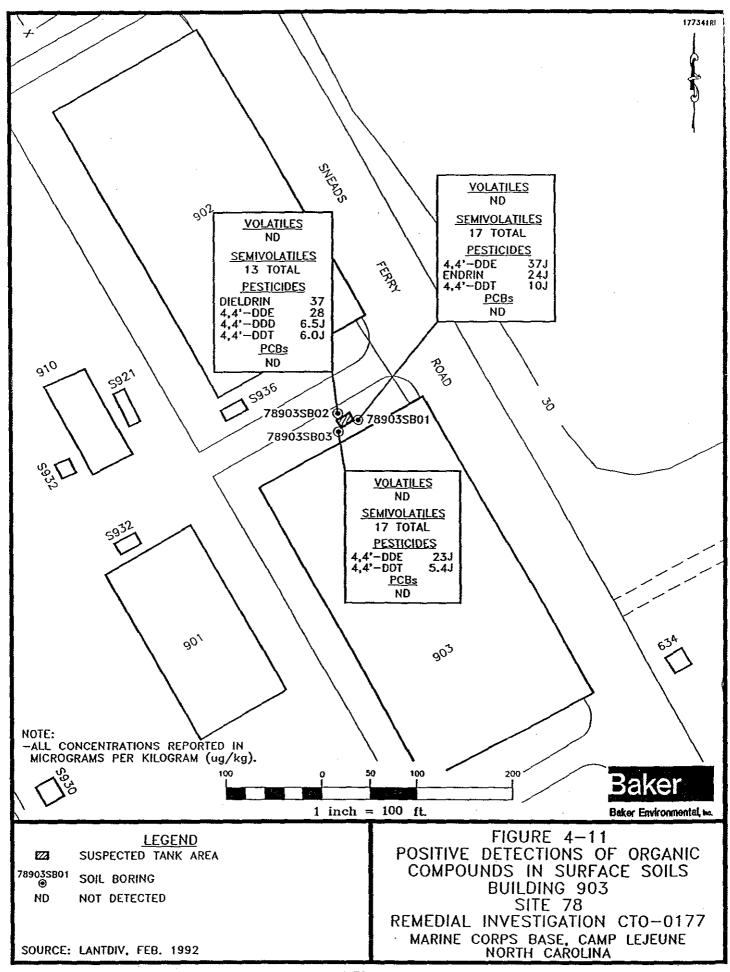
Pesticides were detected in all three surface soil samples collected at Building 903. No pesticides were detected in the subsurface soil samples. The overall pesticide concentrations ranged from 5.4 J µg/kg to 37 J µg/kg. As shown on Figure 4-11, boring 78B903SB02 had the most frequent detections of pesticides which included dieldrin, 4,4'-DDE, 4,4'-DDD, and 4,4'-DDT. Based on the relatively low concentrations present, it appears that the pesticides may be the result of spraying activities instead of direct disposal.

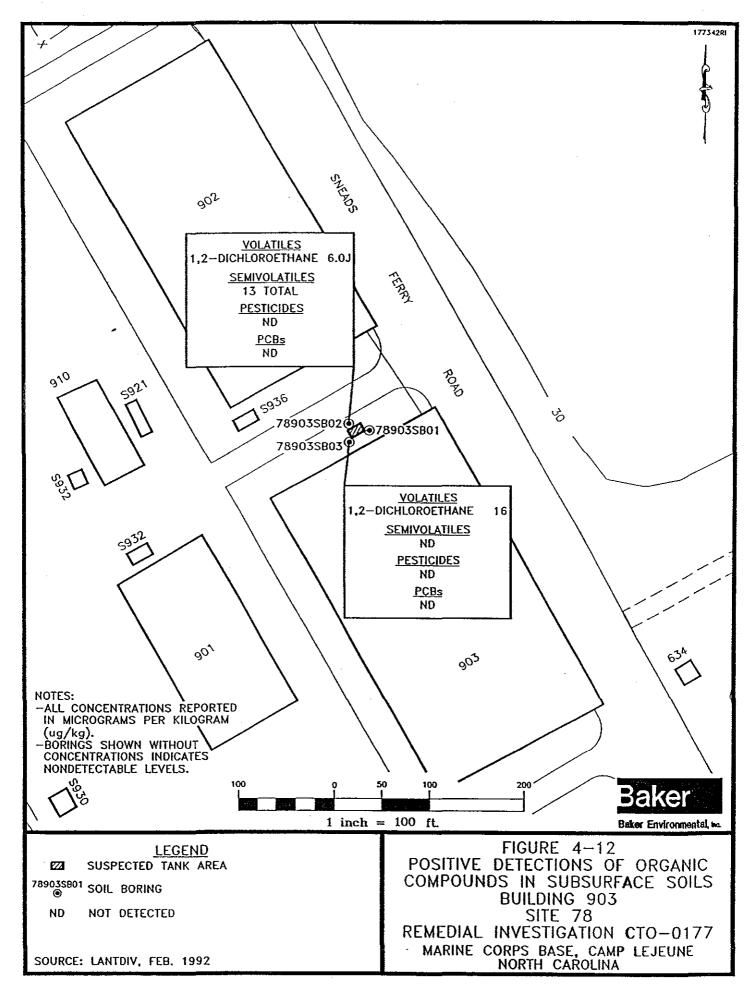
Building 1103

Analytical data indicated that organic compounds (i.e., VOCs, SVOCs and pesticides) and a few metals (barium, lead, and zinc) are the predominant contaminants impacting soils at Building 1103. Accordingly, only the extent of these contaminants will be discussed for this site.

Volatiles

VOCs were detected in only one surface sample which was collected from boring 78B11SB04. Concentrations of toluene and total xylenes were detected at 9.0 J and 10 J µg/kg, respectively. As depicted on Figure 4-13, the extent of VOC impacted soil appears to be limited to the immediate area (surface soils only) of boring 78B11SB04 since adjacent borings did not exhibit VOCs. Further, note that VOCs were not detected in the subsurface soil samples (Figure 4-14).





<u>VOLATILES</u>							
	SAMPLE NO.	78-B1608-SB03-00	78-B1608-SB04-00	78-B1608-SB05-00	78-B903-SB01-00	78-B903-SB02-00	78-B903-SB03-00
	DEPTH UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
ain about minutes	UNITS		11 U	11 U			12 U
CHLOROMETHANE		11 U			12 U	13 U	
BROMOMETHANE		11 U	11 U	11 U	12 U	13 U	12 U
VINYL CHLORIDE		11 U	11 U	11 U	12 U	13 U	12 U
CHLOROETHANE		11 U	11 U	11 U	12 U	13 U	12 U
METHYLENE CHLORIDE		11 U	11 U	11 U	12 U	13 U	12 U
ACETONE		ון טו	41 U	16 U	12 U	13 U	12 U
CARBON DISULFIDE		11 UJ	11 U	11 U	12 U	13 U	12 U
1,1-DICHLOROETHENE		11 U	11 U	11 U	12 U	13 U	12 Ü
1,1-DICHLOROETHANE		11 U	11 U	11 U	12 U	13 U	12 U
1,2-DICHLOROETHENE (total)		11 U	11 U	11 U	12 U	13 U	12 U
CHLOROFORM		11 U	11 U	11 U	12 U	13 U	12 U
1,2-DICHLOROETHANE		11 U	ט וו	11 Ų	12 U	13 U	12 U
2-BUTANONE		ម ម	11 U	11 U	12 U	13 U	12 U
1,1,1-TRICHLOROETHANE		11 U	II U	11 U	· 12 U	13 U	12 U
CARBON TETRACHLORIDE		11 U -	11 U	11 U	12 U	13 U	12 U
BROMODICHLOROMETHANE		11 U	11 U	11 U	12 U	13 U	12 U
1,2-DICHLOROPROPANE		11 U	11 U	11 U	12 U	13 U	12 U
CIS-1,3-DICHLOROPROPENE		11 U	11 U	ט וו	12 U	13 U	12 U
TRICHLOROETHENE		11 U	11 ប	11 U	12 U	13 U	12 U
DIBROMOCHLOROMETHANE		11 U	11 U	11 U	12 U	13 U	12 U
1,1,2-TRICHLOROETHANE		11 U	11 U	וו ט	12 U	13 U	12 U
BENZENE		11 U	11 U	11 U	12 U	13 U	12 U
TRANS-1,3-DICHLOROPROPENI	₹	11 U	11 U	11 U	12 U	13 U.	12 U
BROMOFORM		11 U	11 U	11 U	12 U	13 U	l2 U
4-METHYL-2-PENTANONE		11 U	រ ប	11 U	12 U	13 U	12 U
2-HEXANONE		11 U	เมช	11 ប	12 U	13 U	12 U
TETRACHLOROETHENE		11.0	11 U	11 U	12 U	13 U	12 U
1,1,2,2-TETRACHLOROETHANE		11 ប	ti U	11 U	12 U	13 U	12 U
TOLUENE		11 U	11 U	11 U	12 U	13 U	12 U
CHLOROBENZENE		11 U	11 U	11 U	12 U	13 U	12 U
ETHYLBENZENE		11 U	Hυ	11 U	12 U	13 U	12 U
STYRENE		11 U	11 U	เก็บ	12 U	13 U	12 U
XYLENES (total)		11 U	11 U	11 0	12 U	13 Ü	12 U

OPERABL 1 NO. 1 - SITE 78 HADNOT POINT INDUSTRIAL AREA SURFACE SOIL DATA AND FREQUENCY SUMMARY REMEDIAL INVESTIGATION CTO - 19177 MCB CAMP LEJEUNE, NORTH CAROLINA ORGANIC CHEMICALS

SEMTVOLATILES

<u>Semivolatiles</u> Sample no.	78-B1608-\$B03-00	78-B1608-SB04-00	78-B1608-SB05-00	78-B903-SB01-00	78-B903-SB02-00	78-B903-\$B03-00
DEPTH						
UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UO/KG
PHENOL	370 U	350 U	360 U	410 U	450 U	380 U
BIS(2-CHLOROETHYL)ETHER	· 370 U	350 U	360 U	410 U	450 U	380 U
2-CHLOROPHENOL	370 U	350 U	360 U	410 U	450 U	380 U
1,3-DICHLOROBENZENE	370 U	350 U	360 U	410 U	450 U	380 U
1,4-DICHLOROBENZENE	370 U	350 U	360 U	410 U	450 U	380 U
1,2-DICHLOROBENZENE	370 U	350 U	360 U	410 U	450 U	380 U
2-METHYLPHENOL	370 U	350 U	360 U	410 U	450 U	380 U
2,2'-OXYBIS-1-CHLOROPROPANE	370 U	350 U	360 U	410 U	450 U	380 U
4-METHYLPHENOL	370 U	350 U	360 U	410 U	450 U	380 U
N-NITROSO-DI-N-PROPYLAMINE	370 U	350 U	360 U	410 U	450 U	380 U
HEXACHLOROETHANE	370 U	350 U	360 U	410 U	450 U	380 U
NITROBENZENE	370 U	350 U	360 U	410 U	450 U	380 U
ISOPHORONE	370 U	350 U	360 U	410 U	450 U	380 U
2-NITROPHENOL	370 U	350 U	360 U	410 U	450 U	380 U
2,4-DIMETHYLPHENOL	370 U	350 U	360 U	410 U	450 U	380 U
BIS(2-CHLOROETHOXY)METHANE	370 U	350 Ŭ	360 U	410 U	450 U	380 U
2,4-DICHLOROPHENOL	370 U	350 U	360 U	410 U	450 U	380 U
1,2,4-TRICHLOROBENZENE	370 U	350 U	360 U	410 U	450 U	380 U
NAPHTHALENE	370 U	350 U	360 U	1400	450 U	81 J
4-CHLOROANILINE	370 U	350 U	360 U	410 U	450 U	380 U
HEXACHLOROBUTADIENE	370 U	350 U	360 U	410 U	450 U	380 U
4-CHLORO-3-METHYLPHENOL	370 U	350 U	360 U	410 U	450 U	380 U
2-METHYLNAPHTHALENE	370 U	350 U	360 U	440	450 U	380 U
HEXACHLOROCYCLOPENTADIENE	370 U	350 U	360 U	410 U	450 U	380 U
2,4,6-TRICHLOROPHENOL	370 U	350 U	360 U	410 U	450 U	. 380 U
2,4,5-TRICHLOROPHENOL	890 U	840 U	860 U	1000 tt	U 0011	930 U
2-CHLORONAPHTHALENE	370 U	350 U	360 U	410 U	450 U	380 U
2-NITROANILINE	890 U	840 U	860 U	1000 U	1100 U	930 U
DIMETHYL PHTHALATE	370 U	350 U	360 U	410 U	450 U	380 U
ACENAPHTHYLENE	370 U	350 U	360 U	410 U	450 U	380 U
2,6-DINITROTOLUENE	370 U	350 U	360 U	410 U	450 U	380 U
3-NITROANILINE	890 U	840 U	860 U	U 0001	1100 U	930 U
ACENAPHTHENE	370 U	350 U	360 U	1300	110 1	230 <i>I</i>

OPERABLE ... NO. 1 - SITE 78 HADNOT POINT INDUSTRIAL AREA SURFACE SOIL DATA AND FREQUENCY SUMMARY REMEDIAL INVESTIGATION CTO - 19177 MCB CAMP LEJEUNE, NORTH CAROLINA ORGANIC CHEMICALS

SEMIVOLATILES (con't)						
SAMPLE NO.	78-B1608-SB03-00	78-B1608-SB04-00	78-B1608-SB05-00	78-B903-SB01-00	78-B903-SB02-00	78-B903-SB03-00
DEPTH UNITS	UG/KG	UG/KG	UO/KG	UG/KG	UG/KG	UG/KG
2,4-DINITROPHENOL	890 U	840 U	860 U	1000 U	1100 U	930 U
4-NITROPHENOL	890 U	840 U	860 U	1000 U	1100 U	930 U
DIBENZOFURAN	370 U	350 U	360 U	850	450 U	98 J
2,4-DINITROTOLUENE	370 U	350 U	360 U	410 U	450 U	380 U
DIETHYL PHTHALATE	370 U	350 U	360 U	410 U	450 U	380 U
4-CHLOROPHENYL PHENYL ETHER	370 U	350 U	360 U	410 U	450 U	380 A
FLUORENE	370 U	350 U	360 U	1400	450 U	180 J
4-NITROANILINE	890 U	840 U	860 U	1000 U	1100 U	930 U
4,6-DINITRO-2-METHYLPHENOL	890 U	840 U	860 U	1000 U	1100 U	930 U
N-NITROSODIPHENYLAMINE	370 U	350 U	360 U	410 U	450 U	380 U
4-Bromophenyl Phenyl Ether	370 U	350 U	360 U	410 U	450 U	380 U
HEXACHLOROBENZENE	370 U	350 U	360 U	410 U	450 U	380 Ŭ
PENTACHLOROPHENOL	890 U	840 U	860 U	1000 U	1100 U	930 U
PHENANTHRENE	49 J	38 1	360 U	9000	770	1700
ANTHRACENE	370 U	350 U	360 U	2000	170 J	380 1
CARBAZOLE	370 U	350 U	360 U	1100	130 J	230 J
DI-N-BUTYL PHTHALATE	370 U	58 J	360 U	410 U	450 U	380 U
FLUORANTHENE	67 J	110 J	67 J	8800	2100	2600
PYRENE	66 J	100 J	43 J	7600	1500	1900
BUTYL BENZYL PHTHALATE	51 J	42 J	360 U	410 U	450 U	380 U
3,3'-DICHLOROBENZIDINE	370 UJ	350 UJ	360 UJ	410 U	450 U	380 U
BENZO(A)ANTHRACENE	370 U	45 J	360 U	2900	740	1000
CHRYSENE	370 U	63 J	360 U	2300	900	1000
BIS(2-BTHYLHEXYL)PHTHALATE	400 U	350 U	360 U	410 U	450 U	380 U
DI-N-OCTYL PHTHALATE	370 U	350 U	360 U	410 U	450 U	380 U
BENZO(B)FLUORANTHENE	59 J	92 J	46 J	2700	590	710
BENZO(K)FLUORANTHENE	370 U	350 U	360 U	1400	550	500
BENZO(A)PYRENE	370 U	63 J	360 U	2000	540	670
INDENO(1,2,3-CD)PYRENE	370 U	51 J	360 U	330]	210 J	400
DIBENZ(A,H)ANTHRACENE	370 U	350 U	360 U	410 U	450 U	210 J
BENZO(GHI)PERYLENE	370 U	65 J	360 U	300 J	180 J	330 J

OPERAB. .. NO. 1 - SITE 78 HADNOT PO...: INDUSTRIAL AREA SURFACE SOIL DATA AND FREQUENCY SUMMARY REMEDIAL INVESTIGATION CTO - 19177 MCB CAMP LEJEUNE, NORTH CAROLINA ORGANIC CHEMICALS

PESTICIDES/PCBS						
SAMPLE 1		78-B1608-SB04-00	78-B1608-SB05-00	78-B903-SB01-00	78-B903-SB02-00	78-B903-SB03-00
DEP						***
UN	its ug/kg	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
ALPHA-BHC				2.1 UJ	2.3 UJ	2 UJ
BETA-BHC				2.1 UJ	2.3 UJ	2 UJ
DELTA-BHC				2.1 UJ	2.3 UJ	2 UJ
GAMMA-BHC				2.1 UJ	2.3 UJ	2 UJ
HEPTACHLOR				2,1 UJ	2.3 UJ	2 UJ
ALDRIN				2,1 UJ	2.3 UJ	2 UJ
HEPTACHLOR EPOXIDE				2.1 UJ	2.3 U	2 UJ
ENDOSULFAN I				2.1 UJ	2.3 U	2 UJ
DIELDRIN				4.1 UJ	37	3.8 UJ -
4,4'-DDE				37 J	28	23 J
ENDRIN				24 J	4.5 U	3.8 UJ
ENDOSULFAN II				4.1 UJ	4.5 U	3,8 UJ
4,4'-DDD				4.1 UJ	6.5 J	3,8 UJ
endosulfan sulfate				4.1 UJ	4.5 U	3.8 UJ
4,4'-DDT				10 J	6 J	5.4 J
METHOXYCHLOR		•		21 UJ	23 UJ	20 UJ
ENDRIN KETONE				4,1 UJ	4.5 U	3.8 UJ
ENDRIN ALDEHYDE				4.1 <i>UJ</i>	4.5 UJ	3.8 UJ
ALPHA-CHLORDANE				2.1 UJ	2.3 U	2 UJ
GAMMA-CHLORDANE .				2.1 UJ	2.3 Ų	2 UJ
TOXAPHENE				210 UJ	230 U	200 UJ
AROCLOR-1016	37 U	35 UJ	36 U	41 UJ	45 U	38 UJ
AROCLOR-1221	74 U	71 UJ	72 U	84 UJ	91 U	78 UJ
AROCLOR-1232	37 U	35 UJ	36 U	41 UJ	45 U	38 UJ
AROCLOR-1242	37 U	35 UJ	36 U	41 UJ	45 U	38 U.
AROCLOR-1248	37 U	35 UJ	36 U	41 UJ	45 U	38 UJ
AROCLOR-1254	37 U	35 UJ	36 U	41 UJ	45 U	38 UJ
AROCLOR-1260	37 U	35 UJ	36 U	41 UJ	45 U	38 UJ

HERBICIDE	<u>s</u>						
	SAMPLE NO. DEPTH	78-B1608-\$B03-00	78-B1608-SB04-00	78-B1608-SB05-00	78-B903-SB01-00	78-B903-SB02-00	78-B903-SB03-00
	UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SILVEX		120 UJ	110 U	110 UJ		'	
2,4-D		120 UJ	110 U	110 UJ			

OPERABLE NO. 1 - SITE 78 HADNOT POINT INDUSTRIAL AREA SURFACE SOIL DATA AND FREQUENCY SUMMARY REMEDIAL INVESTIGATION CTO - 19177 MCB CAMP LEJEUNE, NORTH CAROLINA TAL METALS AND CYANIDE

		78-B1608-\$B05-00	78-B903-SB01-00	78-B903-SB03-00
	DEPTH UNITS	MG/KG	MG/KG	MG/KG
ALUMINUM	01110	1410	2640 J	2500 J
ANTIMONY		0.64 UJ	1.7 UJ	1.6 UJ
ARSENIC		1.1 B	0.8 B	1.1 B
BARIUM		62	13.2 B	10.7 B
BERYLLIUM		0.21 B	0.25 U	0.23 U
CADMIUM		2,8	1.2 U	1.2 U
CALCIUM		25600	2910	2980
CHROMIUM		20.7	4 Ј	3.9 J
COBALT		1.7 U	2 U	1.9 U
COPPER		18.4	6.7	3.5 B
IRON		4810	1360 J	1220 J
LEAD		230	54	12.8 J
MAGNESIUM		1550	170 B	144 B
MANGANESE		42.7	14.2	15.3
MERCURY		0.11 U	0.11 U	0.12 U
NICKEL		4.3 U	5 U	4.6 U
POTASSIUM		116 B	87.9 B	58.3 B
SELENIUM		0.28 B	0.25 B	0,33 J
SILVER		0.64 U	0.75 U	0.7 U
SODIUM		138 B	30,9 B	32.8 B
THALLIUM		0.21 U	0.25 UJ	0.23 UJ
VANADIUM		10.5 B	6 B	4.4 B
ZINC		165 J	34.1	18.6
CYANIDE		0,52 U	0.64 U	0,58 U

OPERABLE UNLI NO. 1 - SITE 78 HADNOT POINT INDUSTRIAL AREA SUBSURFACE SOIL DATA AND FREQUENCY SUMMARY REMEDIAL INVESTIGATION CTO - 19177 MCB CAMP LEJEUNE, NORTH CAROLINA ORGANIC CHEMICALS

VOLATILES						5 2 5 224 55 22 6 2	7 75
	SAMPLE NÖ. DEPTH	78-B1608-\$B03-04	78-B1608-SB04-03	78-B1608-SB05-04	78-B903-SB01-02	78-B903-SB02-02	78-B903-SB03-02
	UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
CHLOROMETHANE					12 U	12 ט	12 U
BROMOMETHANE					12 U	12 U	12 U
VINYL CHLORIDE					12 U	12 U	12 U
CHLOROETHANE					12 U	12 U	12 U
METHYLENE CHLORIDE					12 U	12 U	12 U
ACETONE					26	110	40
CARBON DISULFIDE					12 U	12 U	12 U
1,1-DICHLOROETHENE					12 U	12 U	. 12 U
1,1-DICHLOROETHANE					12 U	12 U	12 U
1,2-DICHLOROETHENE (total)					12 U	6.1	16
CHLOROFORM					12 U	12 U	12 U
1,2-DICHLOROETHANE					12 U	12 U	12 U
2-BUTANONE		•			12 U	l2 U	12 U
1,1,1-TRICHLOROETHANE					12 U	12 U	12 U
CARBON TETRACHLORIDE					12 U	12 U	12 U
BROMODICHLOROMETHANE					12 U	12 U	12 U
1,2-DICHLOROPROPANE					12 U	12 U	12 U
CIS-1,3-DICHLOROPROPENE					12 U	12 U	12 U
TRICHLOROETHENE					12 U	· 12 U	12 U
DIBROMOCHLOROMETHANE	•				12 U	12 U	12 U
1,1,2-TRICHLOROETHANE					12 U	12 Ų	12 U
BENZENE					12 U	12 U	12 U
TRANS-1,3-DICHLOROPROPENE	3				12 U	12 U	12 U
BROMOFORM					12 U	12 U	12 U
4-METHYL-2-PENTANONE					12 U	12 U	12 U
2-HEXANONE					12 U	12 U	12 U
TETRACHLOROETHENE					12 U	12 U	- 12 U
1,1,2,2-TETRACHLOROETHANE					12 U	12 U	12 U
TOLUENE					12 U	12 U	12 U
CHLOROBENZENE					12 U	12 U	12 U
ETHYLBENZENE			•	·	12 U	12 U	12 U -
STYRENE					12 U	12 U	12 U
XYLENES (total)					12 U	12 U	12 U

OPERABLE UNIT NO. 1 - SITE 78 HADNOT POINT INDUSTRIAL AREA SUBSURFACE SOIL DATA AND FREQUENCY SUMMARY REMEDIAL INVESTIGATION CTO - 19177 MCB CAMP LEJEUNE, NORTH CAROLINA ORGANIC CHEMICALS

<u>SEMIVOLATILES</u>							
SA	AMPLE NO.	78-B1608-SB03-04	78-B1608-SB04-03	78-B1608-SB05-04	78-B903-SB01-02	78-B903-SB02-02	78-B903-SB03-02
	DEPTH						
	UNITS	UG/KG	UG/KO	UG/KG	UG/KG	UG/KG	UG/KG
PHENOL					400 U	410 U	420 U
BIS(2-CHLOROETHYL)ETHER					400 U	410 U	420 U
2-CHLOROPHENOL					400 U į	410 U	420 U
1,3-DICHLOROBENZENE					400 U	410 U	420 U
1,4-DICHLOROBENZENE					400 U	410 U	420 U
1,2-DICHLOROBENZENE					400 U	410 U	420 U
2-METHYLPHENOL					400 U	410 U	420 U
2,2'-OXYBIS-1-CHLOROPROPANE					400 U	410 U	420 U
4-METHYLPHENOL					400 U	410 U	420 U
N-NITROSO-DI-N-PROPYLAMINE					400 U	410 U	420 U
HEXACHLOROETHANE					400 U	410 U	420 U
NITROBENZENE					400 U	410 U	420 U
ISOPHORONE					400 U	410 U	420 U
2-NITROPHENOL					400 U	410 U	420 U
2,4-DIMETHYLPHENOL					400 U	410 U	420 U
BIS(2-CHLOROETHOXY)METHANE					400 U	410 U	420 U
2,4-DICHLOROPHENOL					400 U	410 U	420 U
1,2,4-TRICHLOROBENZENE					400 U	410 U	420 U
NAPHTHALENE					400 U	74 J	420 U
4-CHLOROANILINE					400 U	410 U	420 U
HEXACHLOROBUTADIENE					400 U	. 410 U	. 420 U
4-CHLORO-3-METHYLPHENOL					400 U	410 U	420 U
2-METHYLNAPHTHALENE					400 U	410. U	420 U
HEXACHLOROCYCLOPENTADIENE					400 U	410 U	420 U
2,4,6-TRICHLOROPHENOL					400 U	410 U	420 U
2,4,5-TRICHLOROPHENOL					960 U	1000 U	1000 U
2-CHLORONAPHTHALENE					400 U	410 U	420 U
2-NITROANILINE					960 U	1000 U	1000 U
DIMETHYL PHTHALATE					400 U	410 U	420 U
ACENAPHTHYLENE					400 U	410 U	420 U
2,6-DINITROTOLUENE			•		400 U	410 U	420 U
3-NITROANILINE				•	960 U	1000 U	1000 U
ACENAPHTHENE					400 U	97 J	420 U

OPERABLE UNIT NO. 1 - SITE 78 HADNOT POINT INDUSTRIAL AREA SUBSURFACE SOIL DATA AND FREQUENCY SUMMARY REMEDIAL INVESTIGATION CTO - 19177 MCB CAMP LEJEUNE, NORTH CAROLINA ORGANIC CHEMICALS

SEMIVOLATILES (con't)							
	PLE NO. DEPTH	78-B1608-SB03-04	78-B1608-SB04-03	78-B1608-SB05-04	78-B903-SB01-02	78-B903-SB02-02	78-B903-SB03-02
	UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
2,4-DINITROPHENOL		······································			960 U	1000 U	1000 U
4-NITROPHENOL					960 U	1000 U	1000 U
DIBENZOFURAN					400 U	410 U	420 U
2,4-DINITROTOLUENE					400 U	410 U	420 U
DIETHYL PHTHALATE					400 U	410 U	420 U
4-CHLOROPHENYL PHENYL ETHER					400 U	410 U	420 U
FLUORENE					400 U	410 U	420 U
4-NITROANILINE					960 U	1000 U	1000 U
4,6-DINITRO-2-METHYLPHENOL					960 U	1000 U	1000 U
N-NITROSODIPHENYLAMINE					400 U	410 U	420 U
4-BROMOPHENYL PHENYL ETHER					400 U	410 U	420 U
HEXACHLOROBENZENE					400 U	410 U	420 U
PENTACHLOROPHENOL					960 U	1000 U	1000 U
PHENANTHRENE					400 U	590	420 U
ANTHRACENE					400 U	150 J	420 U
CARBAZOLE					400 U	89 J	420 U
DI-N-BUTYL PHTHALATE					400 U	410 U	420 U
FLUORANTHENE					400 U	700	420 U
PYRENE					400 U	480	420 U
BUTYL BENZYL PHTHALATE					400 U	410 U	420 U
3,3'-DICHLOROBENZIDINE			•		400 U	410 U	420 U
BENZO(A)ANTHRACENE					400 U	320 J	420 U
CHRYSENE					400 U	300 J	420 U
BIS(2-ETHYLHEXYL)PHTHALATE					400 U	410 U	420 U
DI-N-OCTYL PHTHALATE					400 Ŭ	410 U	420 U
BENZO(B)FLUORANTHENE					400 U	170 J	420 U
BENZO(K)FLUORANTHENE					400 U	190 1	420 U
BENZO(A)PYRENE					400 U	170 J	420 U
INDENO(1,2,3-CD)PYRENE					400 U	100 1	420 U
DIBENZ(A,H)ANTHRACENE					400 U	410 U	420 U
BENZO(GHI)PERYLENE					400 U	95 J	420 U

OPERABLE UNI. NO. 1 - SITE 78 HADNOT POINT INDUSTRIAL AREA SUBSURFACE SOIL DATA AND FREQUENCY SUMMARY REMEDIAL INVESTIGATION CTO - 19177 MCB CAMP LEJEUNE, NORTH CAROLINA ORGANIC CHEMICALS

PESTICIDES/PCE	<u>3S</u>						
	SAMPLE NO.	78-B1608-SB03-04	78-B1608-SB04-03	78-B1608-SB05-04	78-B903-SB01-02	78-B903-SB02-02	78-B903-SB03-02
	DEPTH						
	UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
ALPHA-BHC		1.9 U	1.9 UJ	1,8 U	2 U	2.1 UJ	2.2 UJ
BETA-BHC		1.9 U	1.9 UI	1,8 U	2 U	2.1 UJ	2.2 UJ
DELTA-BHC		1,9 U	1.9 UJ	1,8 U	2 U	2.1 UJ	2.2 UJ
GAMMA-BHC		1,9 U	£.9 UJ	1.8 U	2 U	2.1 UJ	2.2 UJ
HEPTACHLOR		1.9 U	1.9 UJ	1.8 U	2 U	2.1 UJ	2.2 UJ
ALDRIN		1,9 U	1.9 UJ	1.8 U	2 U	2.1 UJ	2.2 UJ
HEPTACHLOR EPOXIDE		1.9 U	1.9 UJ	1.8 U	2 U	2.1 U	2.2 UJ
ENDOSULFAN I		1.9 U	1,9 UJ	1.8 U	2 U	2.1 U	2.2 UJ
DIELDRIN		3.6 U	3.6 UJ	3.4 U	4 U	4.1 U	4.2 UJ
4,4'-DDE		4.4	3.6 UJ	3,4 U	4 U	4.1 U	4.2 UJ
ENDRIN		3.6 U	3.6 UJ	3.4 U	4 U	4.1 U	4.2 UJ
ENDOSULFAN II		3.6 U	3.6 UJ	3,4 U	4 U	4.1 U	4.2 UJ
4,4'-DDD		3.6 U	3.6 UJ	3,4 U	4 U	4.1 U	4.2 UJ
ENDOSULFAN SULFATE		3.6 U	3.6 UJ	3.4 U	4 U	4,1 U	4.2 UJ
4,4'-DDT		5.2	3.6 UJ	3,4 U	4 U	4.1 U	4.2 UJ
METHOXYCHLOR		19 UJ	19 UJ	18 UJ	20 UJ	21 UJ	22 UJ
ENDRIN KETONE		3.6 U	3.6 UJ	3.4 U	4 U	4,1 UJ	4.2 UJ
ENDRIN ALDEHYDE		3.6 U	3.6 UJ	3.4 U	4 U	4.1 U	4.2 UJ
ALPHA-CHLORDANE		1.9 U	1.9 UJ	1.8 U	2 U	2.1 U	2.2 UJ
GAMMA-CHLORDANE		1.9 U	1.9 ប្រ	1.8 U	2 U	2.1 U	2.2 UJ
TOXAPHENE		190 U	190 UJ	180 U	200 U	210 U	220 UJ
AROCLOR-1016		36 U	36 UJ	34 U	40 U	41 U	42 UJ
AROCLOR-1221		73 U	74 UJ	70 U	81 U	84 Ü	86 UJ
AROCLOR-1232		36 U	36 UJ	34 U	40 U	41 U _.	42 UJ
AROCLOR-1242		36 U	36 UJ	34 U	40 U	41 U	42 UJ
AROCLOR-1248		36 U	36 UJ	34 U	40 U	41 U	42 UJ
AROCLOR-1254		36 U	36 UJ	34 U	40 U	41 U	42 UJ
AROCLOR-1260		36 U	36 UJ	34 U	40 U	41 <u>U</u>	42 UJ

	HERBICIDES					•		
		SAMPLE NO.	78-B1608-SB03-04	78-B1608-SB04-03	78-B1608-SB05-04	78-B903-SB01-02	78-B903-SB02-02	78-B903-SB03-02
		DEPTH UNITS	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
SILVEX			110 01	110 U	110 03			
2,4-D			110 UJ	110 UJ	110 UJ			

APPENDIX F.5 BUILDING HP902 MONITORING WELL INFORMATION (ESE, 1992)

Building 1100

TCE was detected in this area during the soil gas investigation. A single shallow well (HPGW19) was installed near this site. This well was sampled three times in 1987 during the Characterization Investigation (analyzed for VOCs, lead and oil and grease) and in 1991 during the Supplemental Characterization (analyzed for full TCL parameters).

O&G (200 ug/L), T12DCE (2.5 ug/L), and TCE (6 ug/L) were detected in this well in the Set One data, consistent with past usage of this area as a service station conducting limited amounts of vehicle maintenance.

The detectable contamination at well HPGW19 was limited to O&G (2,000 ug/L) in the Set Two data. The low levels of T12DCE and TCE detected in the Set One data were reduced to less than the MDL at the time of the Set Two sampling.

No contamination was detected at well HPGW19 in the Set Three data. Previously, low levels of T12DCE and TCE (Set One) and O&G (Set Two) had been detected at this well. Physical conditions at the site, such as low water table, may have reduced contaminant levels to less than the MDL at the time of the Set Three sampling.

Only slight volatile contamination was detected during the Supplemental investigation at well HPGW19. Contaminants detected were limited to three UICs and included 1,2-DCE (.8 ug/L), TCE (2 ug/L), and tetrachloroethane (2 ug/L). No semi-volatile or pesticide contaminants were detected in the well. Metals (Iron, manganese and sodium) were detected above NC primary or secondary drinking water standards.

Buildings 901, 902, and 913

The location of a TCE storage tank next to the building was identified during the records review and the area surrounded by the four monitoring wells was previously utilized for maintenance of heavy equipment. The soil gas investigation detected TCE in a single data point each at both Bldgs. 901 and 902. The shallow wells situated

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near this site are HPGW22, HPGW23, HPGW24-1 and HPGW25. These wells were sampled three times in 1987 during the Characterization Investigation (analyzed for VOCs, lead and oil and grease) and in 1991 during the Supplemental Characterization (analyzed for full TCL parameters).

In the Set One data, all monitor wells detected O&G (100 to 1,000 ug/L); 1,2-DCE (830 and 6,400 ug/L) and TCE (830 and 57 ug/L) were detected in HPGW23 and HPGW24-1; and vinyl chloride (190 ug/L), 1,1-dichloroethane (12 ug/L)), and benzene (2 ug/L) were detected in HPGW24-1. These detected analytes are consistent with the use of TCE and the maintenance of equipment documented to have occurred in this area.

In the Set Two data, all wells were found to contain O&G at levels ranging from 200 to 3,000 ug/L. Very high levels of 1,2-DCE (6,100 and 4,300 ug/L) were identified in HPGW23 and HPGW24-1; these levels are greater than those detected in Set One. TCE was also detected in well HPGW23 at a concentration of 13,000 ug/L. Methylene chloride, a probable laboratory contaminant, was detected in HPGW23 and HPGW25 for the first time in the Set Two data. It is possible that other VOCs, at low levels, may be present in some of the samples but the required pre-analysis dilutions could have rendered them undetectable.

High levels of T12DCE (7,100 ug/L) and TCE (4,300 ug/L) were identified in Well HPGW23 in the Set Three data; these levels are less than those detected in Set Two. TCE was detected in Well HPGW23 at a level less than half that for the Set Two samples. Vinyl chloride was detected in HPGW24-1 (250 ug/L), as it had been in the Set One samples. This target analyte was less than the MDL in the Set Two data. The required pre-analysis dilutions may have rendered other VOCs undetectable.

The greatest volatile contamination detected in the HPIA area during the Supplemental investigation occurred in wells HPGW23 and HPGW24-1 and represented both solvent and fuel related components. Contaminants detected in HPGW23 included

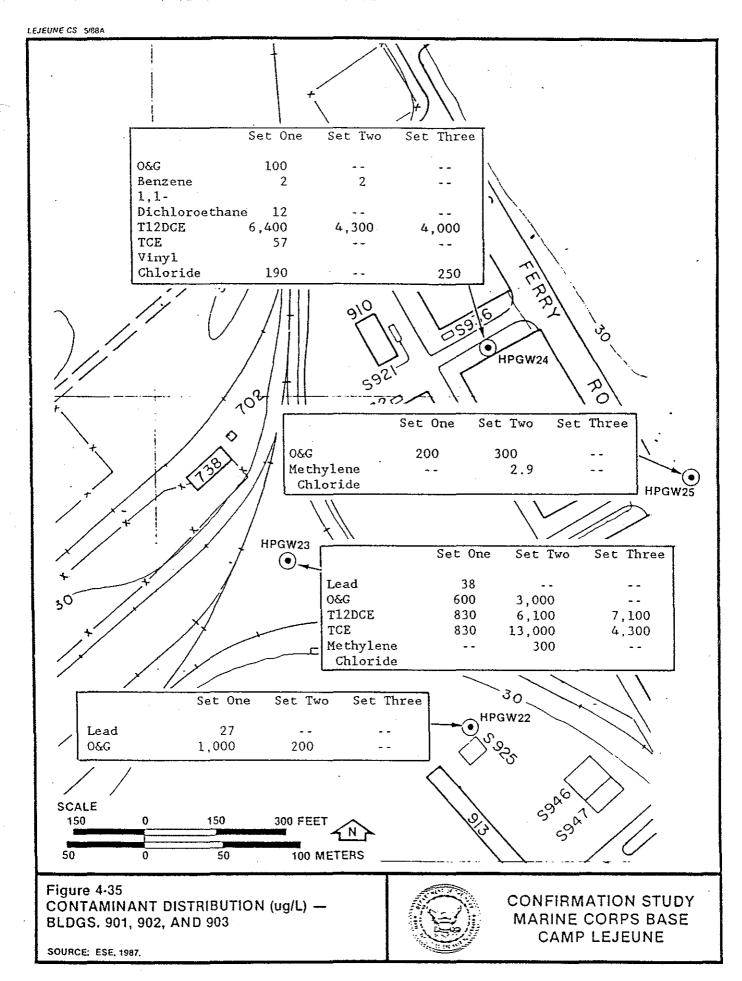
CLEJ-00414-03.13-04/01/92

carbon disulfide (5 ug/L), 1,2-DCE (8,900 ug/L), TCE (3,700 ug/L), benzene (24 ug/L), toluene (13 ug/L), ethylbenzene (9 ug/L) and xylene (41 ug/L) with vinyl chloride being detected as a UIC (8 ug/L). Contaminants detected in HPGW24-1 included carbon disulfide (7 ug/L), 1,1-dichloroethene (65 ug/L), 1,2-DCE (45,000 ug/L identified in an analysis at a secondary dilution factor), TCE (180 ug/L), toluene (13 ug/L), and xylene (10 ug/L) with 1,2-dichloroethane (0.8 ug/L), 1,1,2trichloroethane (3 ug/L), benzene (3 ug/L) and ethylbenzene (3 ug/L) being detected as UICs. Acetone, a laboratory contaminant was detected in well HPGW22 (9 ug/L). No volatile contaminants were detected in well HPGW25. Naphthalene (130 ug/L) was detected in HPGW24-1. Additional contaminants as UICs were identified in HPGW22 (acenaphthene at 3 ug/L, dibenzofuran at 2 ug/L, and 4-nitroaniline at 5 ug/L), HPGW23 (bis[2-ethylhexyl]phthalate at 3 ug/L) and HPGW24-1 (2methylnaphthalene at 3 ug/L and acenaphthalene at 6 ug/L). No semi-volatile contaminants were detected in well HPGW25. Metals (iron, manganese, and sodium) were detected in all four wells above primary or secondary drinking water standards. Additionally, chromium was detected in wells HPGW22, HPGW23 and HPGW25, and lead was detected in well HPGW25 above the standards. No pesticides or PCB compounds were detected.

Well Pairs with Water Supply Wells

A shallow monitor well was installed next to each of five closed water supply wells in HPIA (HPGW2 - WS608, HPGW13 - WS601 replaced as WS660, HPGW20 - WS602, HPGW25 - WS634, and HPGW26 - WS637) to determine if contamination observed in the water supply originated at the surface near the well. These wells were sampled 3 times in 1987 during the Characterization Investigation (analyzed for VOCs, lead and oil and grease) and in 1991 during the Supplemental Characterization (analyzed for full TCL parameters).

In the Set One data, Well HPGW2 (paired with Supply Well 608) was found to contain O&G (700 ug/L), benzene (12 ug/L), chloromethane (5 ug/L), toluene (38 ug/L), and xylene (28 ug/L). This contamination identified in the shallow aquifer



SHALLOW MONITOR WELLS

SET 1 DATA

CHARACTERIZATION INV.

PROJECT NAME NAVY - LEJEUNE LAB COORDINATOR J.D. SHAMIS

SAMPLE 10/#

PARAMETERS UNITS	STORET # METHOD	16 - 148 - 148 - 148	HPGR15 LJHP~1 17	18 HPCH 1	НРСИ17 1 ЈНР-1 19	HPG#18 - 110 20	HPGR19 LJHP-1 21	HPGN20 LJHP-1 22	HPGH21 LJHP-1 23	HPGH22 LJHP-1 24	HPGW23 LJHP-1 25	HPGH24 L JHP - 1 26	HPGH25 LJHP-1 27	28 JHP - 1 28	HPGH29 LJHP+1 31
DATE		01/14/87 17:37	01/15/87 10:46	01/15/87 12:27	01/15/87	01/15/87 17:25	01/16/87 10:12	01/16/87 11:50	01/16/87 14:35	01/19/87 10:20	01/19/87 11:30	01/19/87 14:00	01/19/87 14:50	01/19/87 16:30	01/20/87 11:20
LEAD, TOTAL UG/L	1051 [CAP	(27.0	46.0	45.0	(27.0	<27.0	(27.0	46.0	<27.0	27.0	38.0	<27.0	<27.0	31.0	<27.0
OILAGR.IR HG/L	560	0.2	<0.1	0.2	(0.1	(0.1	0.2	1.0>	0.2	. F	0.6	0.1	0.2	(1.2	0,2
BENZENE UG/L	34030 GMS	(1.0	0,1>	(1.0	(1.0	<i.o< td=""><td><1.0</td><td><1.0</td><td><1.0</td><td>(1.0</td><td><10</td><td>2.0</td><td><1.0</td><td>(1.0</td><td><1.0</td></i.o<>	<1.0	<1.0	<1.0	(1.0	<10	2.0	<1.0	(1.0	<1.0
BRONODICHLOROMETHAN		<2.2	<2.2	<2.2	<2.2	.<2.2	<2.2	<2.2	<2.2	<2.2	<22	<220	<2.2	. <2.2	(2.2
BROMOFORM UG/L	32104 CHS	<4.7	(4.7	<4.7	(4.7	<4.7	(4.7	<4.7	<4.7	<(.7	K47	<470	<4.7	<4.7	<4.7
BROMOMETHANE UG/L	34413 GMS	<\$.8	<\$.B	<5.8	<5.8	<5.8	⟨5.8	<5.8	<5.8	<5.8	<58	<580	<5.8		<5.8
CARBON TETRACHLORID		<2.0	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	₹2.8	₹2.8	<28	(280	<2.8	(2.8	<2.8
CHLOROBE NZENE UG/L	34301 GHS	<6.0	<6.0	6.0	(6.0	(6.0	<6.0	<6.0	<6.0	<6.0	<60	(600	<6.0	<6.u	<6.0
CHLOROETHANE UG/L	34311 GHS	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	⟨8,2	<82	<820	<8.2	48.2	<8.2
2-CHLOROETHYLVINYL ETHER UG/L	34576 GMS	<15	<15	<15	<15	₹26	<15	<15	<15	<15	<150	(1500	<15	< 15	<15
CHLOROFORM UG/L	32106 CMS	<1.6	<1.6	<1.6	۱.6	41.6	41.6	<1.6	4۱.6	<1.6	<16	<160	<1.6	(1,6	<1.6
CHLORONE THANE	34418 CMS	<4.3	<4.3	<4.3	<4.3	<4.3	<4.3	(4.3	<4.3	<4.3	<43	<430	(4.3	(4.3	<4.3
DIBROMOCHLOROMETHAN UG/L	C 32105 GMS	(3,1	<3.1	₹3,1	3.1	<3.1	₹3.1	₹3.1	(3.1	(3.1	<31	, <310	<3.1	₹3.1	<3.1
1,1-DICHLOROETHAHE UG/L	34496 GHS	(4.7	(4.7	(4.7	(4.7	(4.7	(4.7	(4.7	4.7	<4.7	<47	12	<4.7	<4.7	<4.7
1,2-DICHLOROETHANE	34531 GMS:	<2.8	<2.8	<2.8	42.8	<2.8	<2.8	<2.8	<2.8	₹2.8	<28	<280	₹2.8	<2.8	<2.8
I, I-DICHLOROETHYEEN		(2.8	<2.6	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<28	<280	<2.8	<2.8	72.8
TRANS-1.2-DICHLORO	34546 CMS	<1.6	<1.6	<1.6	<1.6	<1.6	2.5	<1.6	<1.6	<1.6	830	6400	41.6	<1.6	(1.6
1,2-01 CHLOROPROPANE	34541 OMS	(6.0	(6.0	<6.0	<6.0	(6.0	<6.0	<6.0	<6.0	0.3>	<60	(600	<6.0	<6.0	<6.0
CIS-1, 3-DICHIORO PROPENE UG/L	34704 GHS	. <5.0	(5,0	⟨\$.0	<5.0	<5.0	<5.0	₹5.0	<5.0	<5.0	<50	₹500	₹5.0	<5.0	<5.0
TRANS 1,3-DICHLORO PROPENE UG/L	34699 GMS	(6.4	(6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<64	<640	<6.4	(6.4	<6.4

PROJECT NAME NAVY - LEJEUNE LAB COORDINATOR J.D. SHAMIS

SAMPLE 10/#

PARAMETERS UNITS	STORET # MCTHOD	HPGH 14 LJIIP~1 16	HPGH15 LJHP-1 17	18 19 19 18	HPGW 17 LJHP-1 19	НРСИ 18 L JHP - 1 20	HPGH19 LJHP-1 21	HPGH20 LJHP-1 ,22	HPGH21 1 JHP - 1 23	HPGW22 LJHP-1 24	HPCK23 LJHP-1 25	HPGH24 LJHP-1 26	НРСЖ25 ЦЗНР-1 27	HPGH26 LJHP • 1 28	HPGK29 LJIIP-1 31
DATE TIME		01/14/87 17:37	01/15/87 10:46	01/15/87 12:27	01/15/87 13:56	01/15/87 17:25	01/16/87 10:12	01/16/87 11:50	01/16/87 14:35	01/19/87 10:20	01/19/87 11:30	01/19/87 14:00	01/19/87 14:50	01/19/87 16:30	01/20/87 11:20
ETHYLBENZENE UG/L	34371 CMS	<7.2	<7.2	<7.2	<7.2	⟨7.2	<7.2	⟨७.2	<7.2	<7.2	<72	<720	(7.2	<7.2	(7.2
METHYLENE CHLORIDE UG/L	34423 GHS	<2.8	<2.8	(2.8	<2.8	<2.8	<2.8	<2.8	<2.8	(2.8	<28	<280	(2.8	₹2.8	<2.8
1,1,2,2-TETRACHLORO	34516 CMS	4.1	4.1	(4.1	(4.1	(4.1	4.1	(4.1	<4.1	<4, 1	(41	(410	(4.1	44.1	C4.1
TE TRACHLOROE THEHE UG/L	34475 CMS	<3.0	C3.0	<3.0	⟨3.0	. <3.0	<3.0	(3.0	<3.0	<3.0	<30	<300	⟨3,0	(3.0	<3.0
TOLUENE UG/L	34010 CHS	(6.0	<6.0	(6.0	<6.0	<6.0	<6.0	0.8>	<6.0	<6.0	<60	<600	<6.0	(6,0	<6.0
I, I, I-TRICHL*ETHANE	34506 6#S	<3.8	<3.8	<3.8	(3.8	<3.8	<3.8	`⟨3.8	<3.8	<3.8	<38	<380	<3.8	<3.6	(3,B
1,1,2-TRICHL'ETHANE UG/L	34511 GHS	<5.0	<5.0	<5.0	<5.0	. <5.0	(5.0	₹5.0	<5.0	<5.0	<50	<500	<5.0	<5.6	<5.0
TRICHLOROETHENE UG/L	39180 CMS	<3.0	<3.0	<3.0	(3.0	0.1>	6.0	<3.0	₹3.0	(3.0	830	57	<3.0	(3,11	<3.0
TRICHLOROF LUCRO-	34488 CMS	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<3.2	<32	(320	<3.2	<3.2	<3,2
VINYL CHLORIDE UG/L	39175 CHS	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<10	190	<1.0	<1.0	<1.0
ACROLE IN UG/L	34210 CMS	<100	<100	<100	(100	<100	(100	<100	<100	<100	<1000	<10000	<100	<10D	<100
ACRYLONITRILE UG/L	34215 GMS	<100	<100	<100	(100	<100	<100	<100	<100	(100	<1000	(10000	<100	<100	<100
DICHLORODIFLUORO- METHANE UG/L	34668 GMS	<10	<10	<10	<10	C 10	(10	(10	<10	ζ10	<100	<1000	<10	<10	<10
M-XYLENE UG/L	98553 GMS	<12	<12	<12	<12	<12	<12	<12	<12	<12	<120	<1208	<12	< 12	<12
O-AND/OR-P XYLENE	98554 GMS	<12	<12	<12	<12	<12	<12	<12	<12	<12	<120	<1200	<12	<12	<12
NETHYL ETHYL KETONE	81595	<48	<48	<48	<48	<48	<48	<48	<48	<48	<480	<4800	<48	<48	. <48
ncihar irobni Mcihar irobni Mcihar irobni Mcir	CHS 81596 CHS	<12	<12	<12	<12	<12	<12	<12	<12	<12	<120	<1200	<12	<12	<12

PROJECT HUMBER 86447 0404 FIELD GROUP LJHP-2

PROJECT MAME NAVY - LEJEUNE HP2 LAB COORDINATOR J.D. SHAMIS

SAMPLE ID/#

PARAMCTERS UNITS	STORET #	HPGH14 LJHP-2 16	HPGH15 LJHP-2 17	. HPCW16 LJEP-2 18	НРСИ17 LJHP-2 19	НРСН 8 LJНР-2 20	18PGH 19 LJHP-2 21	HPGH20 LJHP-2 22	HPGH21 LJHP-2 23	HPGH22 LJHP-2 24	HPG#23 LJEP-2 25	HPGH24 LJHP-2 26	HPGW25 LJHP-2 27	11PGH26 LJIIP - 2 28	HPGH29 LJHP-2 29
DATE TIME		03/09/87 3:55	03/09/87 15:10	03/10/87 12:07	. 03/10/87 12:26	03/10/87 11:40	03/10/87 13:35	03/10/87 13:50	03/10/87 16:26	03/11/87 10:42	03/11/87 10:25	03/11/87 2:01	03/11/87 12:15	03/12/87 13:10	03/12/87 14:00
LEAD, TOTAL UG/L	105 F	<27.0	<27.0	41.0	<27.0	<27.0	(27.0	.33.0	(27.0	<27.0	(27.0	<27.0	<27.0	<27.0	52.0
OIL&GR.IR MG/L	560	<0.1	<0.1	3	3	2	2	3	2	. 2	3	2	0.3	2	<0.1
BENZENE UG/L	34030 GHS	(1,0	(1,0	<1.0	(1.0	<1.0	<1.0	<1.0	<1.0	41.0	<100	<100	. (1.0	C1.0	0.1>
BROMODICHLOROMETHAN		<2.2	₹2.2	<2.2	<2.2	(2.2	<2.2	<2.2	<2.2	<2.2	(220	<220	<2.2	. <2.2	<2.2
BRONOFORM UG/L	32104 GMS	<4.7	<4.7	<4.7	<4.7	(4.7	(4.7	<4.7	<4.7	· <4.7	(470	<470	(4.7	(4.7	<4.7
BRONOME THANE UG/L	34413 GMS	<5. <u>8</u>	<5.8	<5.8	<5.8	<5.8	<5.8	<5.8	<5,0	<5.8	(580	<580	₹5.8	<5.8	<5.8
CARBON TETRACHLORIC		<2.8	(2.8	<2.8	<2.8	(2.8	(2.8	<2.8	<2.8	<2.8	(280	<280	(2.8	⟨2.8	<2.8
CHLOROBENZENE UG/L	34301 GHS	<6.0	<6.0	<6.0	<6.0	<6.0	(6.0	<6.0	<6.0		(600	(600	(6.0	(6,0	<6.0
CHLOROETHANE UG/L	34311 GMS	<8.2	<8.2	<8.2	₹8.2	<8.2	<8.2	<0.2	<8.2	18.2	(820	⟨₿20	⟨8.2	₹8.2	<8.2
2-CHLOROETHYLVINYL ETHER UG/L	34576 GHS	<15	<15	< 15	<15	<15	<1S	<26	<26		<1500	<1500	<26	₹26	<15
CHLOROFORM UG/L	32106 GMS	<1.6	<1.6	6.17	<1.6	(1.6	<1.6	<1.6	<1.6	(1.6	(160	<160	(1,6	۱.6	41.6
CHLOROME THANE	344 1B GMS	<4.3	<4.3	<4.3	(4.3	<4.3	<4.3	<4.3	<4.3	.<4.3	(430	<430	<4.3	<4.3	<4.3
DI BROHOCHLORONE THAN		(3,1	1, 6>	₹3.1	(3.1	(3,1	43. I	(3,1	(3.1	₹3.1	<310	<310	⟨3,	(3,1	(3.1
1.1-DICHLOROETHANE	34496 GMS	<4.7	4.7	<4.7	(4.7	<4.7	<4.7	(4.7	(4.7	<4.7	<470	<470	(4.7	<4.7	4.7
1,2-DIGHLOROETHANE	34531 CHS	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.B	<2.8	<2.8	<280	<280	. <2.8	<2.8	⟨2,8
I, I-DICHLOROETHYLEN		<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	₹2.8	<2.8	(280	<280	(2.8	<2.8	<2.8
TRANS-1,2-DICHLORO	34546 GMS	(1,6	<1.6	<1.6	<1.6	(1.6	<1.6	۱.6	<1.6	<1.6	6100	4300	6.1>	(1.6	<1.6
1,2-DICHLOROPROPANE		<6.0	<6.0	<6.0	⟨6.0	(6.0	<6.0	<6.0	<6.0	<6.0	<600	<600	(6,0	<6.0	<6.0
CIS-1,3-DICHLORO PROPENE UG/L	34704 CMS	<5.0	<5.0	<5.0	<5.0	⟨\$,0	<5.0	<5.0	⟨\$.0	(5.0	<500	⟨500	₹5.0	(5,0	<5.0
TRANS-1,3-DICHLORO PROPENE UG/L	34699 GMS	(6.4	<6.4	<6.4	(6.4	(6.4	(6.4	₹6.4	⟨6.4	(6.4	<640	<640	<6.4	<6. 4	(6.4

ENVIRONMENTAL SCIENCE & ENGINEERING 12/01/87 STATUS: FINAL

PAGE# 4

PROJECT NUMBER 86447 0404 FIELD GROUP LJHP-2

PROJECT NAME NAVY ~ LEJEUNE HP2 LAB COORDINATOR J.D. SHAMIS

SAMPLE ID/#

PARAMETERS UNITS	STORET #	HPGW14 LJHP-2 16	HPGN15 LJHP-2 17	HPGH16 LJHP-2 18	HPGH17 LJHP-2 19	HPCH18 LJHP-2 20	11PGH 19 LJHP-2 21	нрси20 L JHP - 2 22	HPGH21 LJHP-2 23	HPGH22 LJHP-2 24	HPGH23 LJHP-2 25	HPGH24 LJHP-2 26	HPGH25 LJIIP-2 27	11PGH26 1JHP-2 28	HPGN29 LJHP-2 29.
DATE TIME	÷	03/09/87 13:55	03/09/87 15:10	03/10/87 12:07	03/10/87 12:26	03/10/87	03/10/87 13:35	03/10/87 13:50	03/10/87 16:26	03/11/87 10:42	03/11/87 10:25	03/11/87 12:01	03/11/87 12:15	03/12/87 13:10	03/12/87 14:00
ETHYLBEHZENE UG/L	34371 CMS	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<7.2	<720	<720	<7.2	<7.2	<7.2
METHYLENE CHLORIDE UG/L	34423 GMS	<2.8	<2.8	<2.8	<2.8	<2.8	<2.8	3.4	. <2.8	<2.8	300	<280	2.9	6.5	<2.8
1,1,2,2-TETRACHLORD ETHANE UG/L		(4.1	4.1	4.1	(4.)	44. I	(4.1	4.1	(4.1	4.1	C£10	<410	44.1	<4.1	44 , L
TETRACHLOROETHENE UG/L	34475 GMS	<3.0	<3.0	<3.0	<3.0	, <3.0	<3.0	<3.0	<3.0	<3.0	<200	<200	<3.0	<3.0	K3.0
TOLUENE UG/L	34010 GMS	(6.0	(6.0	<6.0	(6.0	(6.0	(6.0	(6.0	<6.0	(6.0	<600	(600	<6.0	<6.0	₹6.0
1,1,1-TRICHL'EIHANE UG/L		<3.8	(3,8	<3.8	⟨3.8	<3.8	(3.8	<3.8	⟨3,8	(3.8	<300	<380	<3.8	<3.8	<3.8
I, I, 2-TRICHL 'ETHANE UG/L		<5.0	(5.0	<5.0	<5.0	<5.0	(5.0	₹5,0	⟨\$.0	<5.0	<500	<500	<5.0	<5.U	<5,0
TRICHLOROETHENE UG/L	39180 GMS	(3.0	<3.0	<3.0	<3.0	(3,0	(3.0	(1.0	<1.0	(1,0	13000	(100	<1.0	0,1>	<3.0
TRICHLOROFLUORO- METHANE UG/L	34488 GMS	<3.2	<3.2	<3.2	<3.2	(3.2	<3.2	<3,2	(3.2	(3.2	<320	<320	<3.2	<3.2	<3.2
VINYL CHLORIDE UG/L	39175 GMS	(1.0	<1.0	<1.0	(1.0	<1.0	(1,0	<1.0	٠ (١,٥	<1.0	<100	(100	<1.0	(1.0	0.1>
ACROLE IN UG/L	34210 GHS	<100	<001>	. <100	<100	<100	(001)	<100	<100	<100	<10000	<10000	<100	(100	<100
ACRYLONITRILE UG/L	34215 Chs	<100	<100	<100	(100	<100	<100	(100	<100	<100	<10000	<10000	<100	<100	<100
DICHLORODIFLUORO- METHANE UG/L	34668 GHS	(10	<10	<10	<10	<10	<10	(10	<10	<10	<1000	<1000	<10	(10	<10
M-XAFEHE AG\r	98553 CMS	<12	<12	<12	<12	< 12	<12	<12	<12	<12	<1200	<1200	(12	<12	<12
O-AND/OR-P XYLENE UG/L	98554 GMS	<12	<12	<12	₹12	<12	<12	<12	<12	<12	<1200	<1200	<12	<12	<12
MELHAF ETHAF KELOHE		(48	<48	(48	<48	<48	<48	<48	<48	(48	<4800	<4809	(48	<48	′ <48
METHYL ISOBUTIKETONI UG/L		<12	<12	<12	. <12	<12	<12	<12	<12	<12	<1200	<1200	<12	(12	(12

CLEJ-00414-03-13-04/01/92

EXAMENDATIVE SEACHER REPORTERING TOTALISM THAT PAREN

PROJECT NUMBER 6847 ONCE PROJECT WHE HAVE - CLEAN FOR FILED PROJECT PROCEDURE ALCOHOLS AND STATES OF STATES.

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CLEJ-00414-03.13-04/01/92

THE EXPERIMENT SECURE ENCHANGES IN THOSE STATES CHIMAL PLANT

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PERCET MASSA BEHALOSOS FICLE (2012) - LAPPAS

13.45.480 13.45 <u>ن</u> ن. ី --15.55 15.55 ٦ ا S. 3 S 2 3 뜽 ä ij 2:45 ۲. :: 9. (7) ű. ę, E . 2 . 31 ŗ Ö 3 9 饠 $\frac{2}{2}$ ŭ. ů. Ċ, 11:23 (-(-. 1 <u>ت</u> 15/25/33 ÷ :: L. IF-) 3 ü 8 Ξ 7 7 ᄣ (5) (3) 空 マ Ş 8 \$ ŝ (-'H) 05/13/37 ₿ 8 Ξ 200 Ÿ. 41000 CIDICI 500 CI 233 ((61) 会 会 会 当 に 事 り 13:25:61 W. 31133 0.0000 3,10000 <u>\$</u> ₹ 7350 **#EC** CLEC \$25 133 1230 \$ 1200 \$ 1200 321 125 15.43.1 1.43.1 13:33 3 Ç .e. 0.55 06-23-33 8 3 3 3 13/3/4 1.14-7 9.5 -15/26/67 E: E: Ç. Ö 3 8 0 ŝ 8 ... !! 3 2 = 1748 1748 1748 1748 e C 15:33 0.0 :5.0 06/23/37 8 3 ده (ز) ć ... उ 17 .. 3 31: 7.0 #64. #4-11 5: IC et C (5,737.63 ₫. õ ∴ 0. 9 <u>\$</u> 번 0 ä ... 25,28,63 ۲. ۳. Ö 3 놠 8 3 O đ Ç : E Will 6.3 ί. Φ ៊ ©. (5,23,37 () () 8 ŝ ä <u>::</u> 35.28.280 3. EC 476.16 JPP13 eg Ç 3.2 . 5 Ξ 3 Ξ ÷ ij # ÷ 3 ٥ "! C +30,45 1.18†+3 _ 75.2E.ET 5 1 53 5 ŝ 0 Ξ 9 T P K C E £: 4 9.0 53.3 5.0 05,623,33 ä 3 <u>...</u> ij 13676 15766 93553 957. Kinn Chan alton 957. Kinn 1986/1154. 18.8 2,7, ~79.04 (TRSE 18.1 18.1, 2~79.05 (TRSE TACE SWHIST 127. 1710-1,037.0.210-1714-17. 127. 1116. 91.03.11 ETAME CEAL 937。 外網和B中代[16] 11.118 TRICH, DRUGGERENE 7.5 1. FT 11 D. AFC# THIBUTTH 38]...;J464c 1· 红龙 知为法司 F)...H

CAMP LEJEUNE - HPIA VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS) Concentration in ug/l

CHART = HPVOL4

wp8b\hp-vol.wr1 (4)

	•		,		HPGW26D				224.0
СОМРОИНО		KPGW24-1	HPGW25	HPGW26	(GWDUP8)	HPGW29	21GW1	22GW1	22GW2
Chloromethane		10.U	10.0	10.U	10.0	10.0	10.U	10.0	10. U
Bromomethane	?	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.U
Vinyl Chloride	·	25000.U	10.U	10.U	10.0	10.U	10.U	10.0	10.U
Chloroethane		10.U	10.U	10.0	10.U	10.0	10.U	10.0	10.U
Methylene Chloride		5.ช	5.U	3.J	5.0	*31	5.U	5.0	5 . U
Acetone		10.0	10.U	7.BJ	6.BJ	10.0	10.0	10.U	10.U
Carbon Disulfide		7.	5.U	2.J	8.	5.0	5.0	5. U	5.U
1,1-Dichloroethene		65.	5.U	5. U	5. U	5.U	5.U	5.ข	5.U
1,1-Dichloroethane		5.0	5.U	5.0	5.U	5.U	5.0	5,0	5.U
1,2-Dichloroethene (total)		42000.D	5.U	5.0	5.0	5.U	5.0	5.0	5.⊍
Chloroform		5.0	5.0	5.U	5.U	5.0	5.0	5.0	5.0
1,2-Dichloroethane		.8J	5.U	5.0	5.U	5.ŭ	5.0	110.B	5.0
2-Butanone		10.U	10.0	10.0	10.0	10.ຍ	10.U .	10.U	10.ប
1,1,1-Trichloroethane		5.0	5.0	5.U	5.U	5.0	5.U	5.U	5.∪
Carbon Tetrachloride		5.0	5.0	5.U	5.U	5.U	5.U	5.U	5.0
Vinyl Acetate		10.ប	10.U	10.U	10.U	10.0	10.0	10.U	10.0
Bromodichloromethane		5.U	5.U	`5.U	5.บ	5.U	5.U	5.U	5.U
1,2-Dichloropropane		5.U	5.0	5.U	5.0	5.U	5.U	5.0	5.U
cis-1,3-Dichloropropene		5.U	5.0	5,0	5.U	5 . U	5.U	5.0	5 . U
Trichloroethene		180.	5.0	5.U	5 .U	5.บ	5.0	5.J	5.0
Dibromochloromethane		5.U	5.U	5.U	5.0	5.0	5.U	5.0	5.U
1,1,2-Trichloroethane		3.J	5.U	5.U	5.0	5.U	5.U	5.0	5.4
8enzene		3,1	5.0	5.U	5.U	5.U	5.0	7900.	5 .U
trans-1.3-Dichloropropene		5.U	5.U	5.0	5.U	5.ປ	5.0	5.0	5 . u
Bromoform		5.U	5.U	5.U	5.0	5.U	5.U	5.0	5 . u
4-Methyl-2-Pentanone		10.U	10.0	10.0	10.0	10.U	10.U	10.ບ	10.0
2-Hexanone		10.U	10.0	10.0	10.0	10.U	10.0	10.0	10.ប
Tetrachioroethene		5.U	5.U	5.U	5.U	5.0	5.U	5.U	5 .U
1,1,2,2-Tetrachloroethane		5.U	5.U	5.0	5.0	5,0	5.0	5,0	5.0
Toluene		13.	5. u	5.0	5.U	5.U	5.0	16000.	5.u
Chlorobenzene		5.0	5.U	5.U	5.0	5.0	5.0	5.U	5.ປ
Ethylbenzene		3.J	5.0	5.0	5.U	5.0	5.U	1900.J	5.U
Styrene		5.U	5.U	5.ບ	5.0	5.0	5.U	5.U	5 . u
Xylene (total)		10.	5.0	5.U	5.0	5.0	5.U	9800.	5.0

CAMP LEJEUNE - HPIA SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS) Concentration in ug/l

CHART = HPSV4A

wp8c\hp-sv.wr1 (4-A)

CHART = HPSV4A								
COMPOUND	KPG24-1	HPGW25	KPGW26	HPGW260 (GWDUP8)	HPGW29	21GW1	22GW1	22GW2
henol	10.U	10.0	10.0	10.0	10.0	10.U	10.0	10.U
is(2-Chloroethyl)ether	10.U	10.U	10.0	10.0	10.U	10.0	10.0	10.U
-Chlorophenol	10.U	10.0	10.0	10.U	10.0	10.0	10.0	10.U
.3-Dichlorobenzene	10.0	10.ប	10.0	10.0	10.0	10.U	10.0	10.Ų
4-Dichlorobenzene	10.U	10.0	10.U	10.0	10.0	10.0	10.0	10.0
enzyl Alcohol	· 10.U	10.U	10.0	10.0	10.ប	10.0	10.0	10.0
,2-01chlorobenzene	10.U	10.U	10.0	10.0	10.U	10.U	10.U	رے 10.0
-Methylphenol	10.0	10.ប	10.0	10.0	10.0	10.U	10.J	10.4
is(2-Chloroisopropyl)ether	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.4
-Methylphenol	10.0	10.0	10.U	10.0	10.0	10.U	10.0	10.0
Witroso-di-n-propylamine	10.U	10.0	10.U	10.0	10.U	10.0	10.U	10.0
exachloroethane	10.U	10.0	10.U	10.0	10.0	10.0	10,0	10.4 ` } `
trobenzene .	10.0	10.0	10.0	10.0	10.0	10.ប .	10.U	10.4.
ophorone	10.U	10.U	10.0	10.U	10.0	10.0	10.U	10.4 🧲
Nitrophenol.	10.U	10.U	10.U	10.U	10.0	10.U	10.U	10.0 🗧
4-Dimethylphenol	10.U	10.0	10.0	10.0	10.0	10.0	10.0	10.4 🚬 🖔
nzaic acid	50.0	50.0	50.0	50.U	50.U	50.0	50.U	50.0
s (2-Chloroethoxy) methane	10.0	10.ប	10.0	10.U	10.U	10.0	10.0	10.ហ
4-Dichlorophenol	10.0	10.0	10.0	10.U	10.ប	10.U	10.0	10.U 🖯
2,4-Trichlorobenzene	10.0	10.U	10.0	10.U	10.0	10.U	10.0	10.0
phthalene	130.	10.U	10.0	10.U	10.0	10.U	230.	10.U C
Chtoroaniline	10.0	u.0f	10.U	10.0	10.0	10.U	10.0	10.U 10.U 10.U
exachlorobutadiene	10.0	10.U	10.0	10.0	10.0	10.U	10.0	10.0
Chloro-3-methylphenoi	10.0	10.U	10.0	10.0	10.0	10.0	10.0	10.01
Methylnaphthalane	3.J	10.U	10.0	10.0	10.U	10.0	28.	10.4
xachlorocyclopentadiene	10.0	10.U	10.0	10.U	10.0	10.0	10.0	10.0
4,6-Trichlorophenol	10.0	10.0	10.U	10.U	10.U	10.0	10.U	10.0
4,5-Trichlorophenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Chloronaphthalene	10.0	10.U	10.U	10.U	10.U	10.U	10.U	10.U
Hitroaniline	50.U	50.U	50.U	50.0	50.U	50.0	50.U	50.U
methylphthalate	10.0	10.U	10.0	10.U	10.U	10.U	10.U	10.U
cenaphthylene	10.0	10.0	10 U	10.0	10.U	10.U	10.U	10.0
6-Dinitrotoluene	10.0	10.0	10.U	10.0	10.U	10.U	10.U	10.ប

CLEJ-00414-03.13-04/01/9

PREPARED BY

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CAMP LEJEUNE - HPIA SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS) Concentration in ug/l

	3LNI -40LNI	Itt okamita	Concentrat	ion in ua/l		-			
CHART # HPSV4B							•	\hp-sv.wr1 (
COMPOUND	HPG24-1	HPGW25	HPGW26	KPGW260 (GWDUP8)	HPG₩29	21GW1	22GW1	22GV2	
3-Witrospiline	50.0	50.U	50.0	50.U	50.U	50.0	50.0	50.U	

COMPOUND	HPG24-1	HPGW25	HPGW26	HPGW260 (GWDUP8)	HPGW29	21GW1	22GV1	22GW2
3-Witrosniline	50.0	50.0	50.U	50.U	50.U	50.U	50.0	50.U
Acenaphthene	6.1	10.0	10.0	10,0	10.U	10.0	10.U	10.0
2,4-Dinitrophenol	50.U	50.0	50.U	50.U	50.U	50.บ	50.U	50.U
4-Nitrophenol	50.U	50.U	50.U	50.U	50.U	50.0	50.U	50.U
Dibenzofuran	10.0	10.U	10.0	10.U	10.0	10.U	10.U	10.0
2,4-Dinitrotoluene	10.0	10.0	10.U	10.U	10.U	10.0	10.0	10.0
Diethylphthalate	10.0	10.0	10.U	10.U	10.U	10.U	10.U	10.0
4-Chlorophenyl-phenylether	10.0	10.U	10.U	10.u	10.U	10.ប	10.0	10.0
Fluorene	10.0	10.U	10.U	10.0	10.U	10.0	10.0	10.0
4-Nitroaniline	50.0	50.U	50.U	50.U	50.U	50.U	50.U	50.0
4,6-Dinitro-2-methylphenol	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
N-Witrosodiphenylamine	10.0	10.U	10.U	10.U	10.U	10.U	10.0	10.U
4-Bromophenyl-phenylether	10.0	10.U	10.U	10.U	10.0	10.U	10.U	10.0
Hexachlorobenzene	10.0	10.0	10.U	10.U	10.U	10.0	10.0	10.0
Pentachiorophenol	50.U	50.0	50.u	50.U	50.U	50.U	50.U	50.U
Phenanthrene	10.ប	10.U	10.U	10.U	10.U	10.ប	10.U	10.0
Anthracene	10.0	10.0	10.U	10.U	10.0	10.U	10.0	10.0
Di-n-butylphthalate	10.0	10.U	10.U	10.0	10.U	10.0	10.U	10.0
Fluoranthene	10.0	10.0	10.U	10.0	10.U	10.U	10.0	10.0
Pyrene	10.0	10.U	10.0	10.U	10.U	10.0	10.0	10.0
Butythenzylphthalate	10.0	10.0	10.0	10.U	10.0	U.01	10.0	10.0
3,3'-Dichlorobenzidine	20.0	20.0	20.0	20.0	20.U	20.U	20.0	20.0
Benzo(a)enthracene	10.U	10.U	10.ប	10.0	10.0	10.0	10.0	10.0
Chrysene	10.0	10.U	10.0	10.0	10.U	10.U	10.0	10.0
bis(2-Ethylhexyl)phthalate	10.ບ	10.0	10.4	10.0	10.0	10.U	10.0	10.0
Di-n-octylphthalate	10.U	10.0	10.U	10.Մ	10.0	10.0	10.0	10.0 '
Benzo(b)fluoranthene	10.U	10.0	10.U	10.U	10.U	10.U	10 . U	10.0
Benzo(k)fluoranthene	10.U	10.0	10.0	10.U	10.0	10.0	10.0	10.8
Benzo(a)pyrene	10.0	10.0	10.U	10.0	10.0	10.0	10.0	10.0
Indeno(1,2,3-cd)pyrene	10.0	10.0	10.0	10.0	10.0	10.0	10.U	10.0
Dibenz(a,h)anthracene	10.0	10.0	10.U	10.0	10.0	10.0	10.U	10.U
Benzo(g,h,l)perylene	10.0	10.0	10.0	10.0	10.0	10.U	10.U	10.U

CLEJ-00414-03.13-04/01/92

CAMP LEJEUNE - HPIA 1NORGANICS IN GROUNDWATER (SHALLOW WELLS) Concentration in ug/l

CHART = HPING4

wp8e\hp-inor.wr1 (4)

	*********			HPGW26-D	~ ^ * * * * * * * * * * * * * * * * * *			
METAL/COMPOUND	HPGW24-1	HPGW25	HPGW26	(GWDUP8)	нром29	21GW1	22GV1	22GW2
	15400	218000	10400	7830N	47800	40400	587000	16900
Antimony	22.0U	13.30	13.3U	13.30	13.30	17.08	20.9B	13.30
rsenic	4.2B	13.2	1.50	1.50	25.6	41.4	50.3	11.0
Barium	60.1B	289	72.0B	67.7B	633	71.08	804	67.0B
eryllium	2.10	2.88	0.500	0.50U	8.7	1.1B	5.8	0.500
Cadmium	4.3U	4.3U	4.30	4.3UN	4.30	4.30	4.3UN	4.30
Catefum	16600	6270	2830B	2770B	59200	60400	33800	127000
thromium	26.3	205	13.0	10.3	179	39.0	457	26.3
Cobalt	6.40	10.5B	6.00	6.00	17.88	10.8B	30.9B	10.98
Copper	11.5B	57.7	9.1B	7.2B	39.9	13.28	81.4	11.28
ron	19200	46600	19000	10900	76200	54900	101000	16200
ead .	. 21.4	71.6	9.0	5.2	29.1	15.8	307	16.2
agnesium	24308	10000	1830B	1710B	15000	10300	21200	7730
langanese	54.8	118	10.6B	8.88	236	200	284	763
ercury	0.100	0.100	0.100	0.100	0.100	0.100	0.35	0.100
lickel	14.00	39.28	5.2U	5.2U	93.5	21.4B	186	17.0B
otassium	3130B	13100	2230B	1580B	5900	4400B	24000	30308
elenium	1.60	3.40	3.40	3.4UN	3.40	3.40	3.4U	4.28
ilver	6.20	3.98	1.60	1.60	3.18	1.60	4.1B	1.60
odium	11800	18200	5910	5690	7850	17400	9560	8570
hallium	1.10	4,40	4.40	4.40	4.40	4.40	4.40	4.4U
anadium	39.28	259	. 149	83.6	108	138	518	40.3B
ine	70.5	119	68.1	43.1	329	233	295	91.8
Cyanide	10.00	10.0U	10.00	10.00	10.0U	10.00	10.00	10.00

CAMP LEJEUNE - HPIA PESTICIDES IN GROUNDWATER (SHALLOW WELLS) Concentration in ug/l

CHART # HPPEST4

sy\wp8b\hp-pest.wr1 (4)

******	***								
PESTICIDE/PCB	XPGW24-1	HPGW25	HPGW26	HPGW260 (GWDUP8)	KPGW29	21GW1	22GW1	22GW2	
Lpha-BHC	.05U	05U	.05U	.05U	. 05U	.05บ	.05U	.05U	
eta-BHC	.05U	.05U	.05U	.05U	.05U	. 05u	.05U	.05U	
delta-BHC	.05U	.05U	.05U	.050	.05U	.05u	.05U	.05U	
jamma-BHC (Lindane)	.05U	.05U	.05U	.05U	.05U	.05u	.05U	.05U	
· leptachlor	.05U	.05U	.05U	.05U	.05U	.05u	.050	.05U	
ldrin	.05U	.05U	.05U	.050	.05U	.05U	.05U	.05U	
leptachlor epoxide	.05U	.05น	.05U	.05U	.05u	. 05บ	.05U	.05บ)
indosulfan I	.05U	.050	.05U	.05U	.05U	.05U	.05U	.05U	1 3
ieldrin	.10U	.100	.10U	.100	.100	. 10u	.10U	.100	
.44-DDE	.100	.100	.10U	.100	.10U	. 10u	.100	.100	33
ndrin	.100	.100	.100	.10U	. 100	_10U	.10U	,10u	2 7 ~
ndosulfan II	.10U	.100	.10U	.100	.100	.100	.10U	.100	300
,4/-DDD	.100	.100	.100	.100	.100	.100	.10U	.10U ∫	.070
ndosulfan sulfate	.100	.100	.100	.100	.100	.100	.10U	.10U	100
,41-DDT	.100	.100	.100	.10U	.100	, 10U	.100	,10U	ンサー
lethoxychlor	.50U	.50U	.500	.50U	.50U	.500	.500	.50U -	マープ・
ndrin ketone	.10U	.100	.100	.10U	.100	. 100	.10u	.100	U 2 7
lpha-Chlordane	.500	.500	.50U	.50U	.500	.500	.500	.500	
jemma-Chlordane	.50U	.50U	.50U	.50U	.50U	.50u	.50U	.500	- 63 - 101
'oxaphene	1.00	1.00	1.00	1.00	1.00	1.00	1.0U	1.00	TEM IC
troctor-1016	.50u	.50U	.50U	. 50u	.500	.500	.500	.50∪ ∫	Q)
roclor-1221	.50U	.500	.50U	.500	.50U	,50U	.50U	.50u	는 문 문
roctor-1232	.500	.50U	.50U	.500	.50U	.500	.50u	.50U	DATE DATE
roctor-1242	.500	.50U	.500	.500	.500	. 50U	.500	.50U	O H
roctor-1248	.50U	.50U	.sou	.50บ	.50u	.50U	.50U	.500	PROJECT PREPARED DATE
roctor-1254	1.00	1.00	1.00	1.00	1.00	1.00	1,00	1.00	
troctor-1260	1.00	1.00	1.0U	1.00	1.00	1.00	1,00	1.00	

CLEJ-00414-03.13-04/01/92

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH,N.C. 27611, PHONE (919) 733-5083

SW 34

WELL CONSTRUCTION RECORD

	FOR OFFICE USE ONLY
Quad. No	Serial No
Lat	Long Pc
Minor Basin _	
1	
Header Ent	GW-1 Ent
ì	

STATE WELL CONSTRUCTION DRILLER REGISTRATION NUMBER PERMIT NUMBER: ____ 1. WELL LOCATION: (Show sketch of the location below) DRILLING LOG Depth (Road, Community, or Subdivision and Lot No.) 2. OWNER . 66 USE OF WELL 1709170 CUTTINGS COLLECTED Tes No 5. DOES WELL REPLACE EXISTING WELL? Yes You FT.

above TOP OF CASING, TOP OF CASING IS 0 50 FT. ABOVE LAND SURFACE. ____ METHOD OF TEST __ ...TER ZONES (depth): _ 9. CHLORINATION: 1" CASING: If additional space is needed use back of form. Diameter Material LOCATION SKETCH (Show direction and distance from at least two State Roads, or other map reference points) 11. GROUT: See Fig. (2-5) 12. SCREEN: Diameter To 25 Ft. 2 11 in. 0-01 in. PUC 13. GRAVEL PACK: 14 REMARKS: I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH THE N STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER. NCAC 2C, WELL CONSTRUCTION

SIGNATURE OF CONTRACTOR OR AGENT

ring No. HPGW24	 .	SHEET	0F
On S.te 1215 PM		11/12/86	
·	<u>, , , , , , , , , , , , , , , , , , , </u>		
1st Spoon 1220 1ast Spoon 120 Well Complete 150			
1 ast Spoon 120			
well Complete 150	· ·		
		·	
Standard Well Spacs.			
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· • • • • • • • • • • • • • • • • • • •	DATE	SIGNED	

SOURCE: Environmental Science and Engineering, Inc., 7:

, NO.	HP 6W 24	Locatión Coordinates N
Size	Slot	, <u>Ε</u>
creen Size_	Mat'1	Filter Materials
asing Size_		Grout Type
ologist		Development
Date Start \	1112 Finish 1112	Static Water Level
Contractor		Top of Well Elevation
Driller		Drill Type

Depth (feet)	Sample	Sketch	Lithology, Color	uscs	SP1 (BL/I
7.5-9.0			1042 4/1, dark Grey Silty Clayey Sand, (Silt+ Clay 45%), Moist, Slightle plasta, mrd. densi-dense	SC Sm	5 10 26
9.0-10.5			1042 6.5/1, Grey-Light Grey, Silty Fine Sand (Silt 10-15%) loose, Slightly dense, moist-wef Top 5" Black Silty Sand) SW	8 !2 !:
14.0-15.5			2.54 4.5/6 Grey-dark Grey, Silty Fine Sandy Clay (silt+ Sand 30%) Stucky, Slights dense, Slightly plastic, wet	SC	Z 1
/9.0-205			74R-2/0, Black, Silty ORGANIC Clay (organic matter 45%), Firm, dense, moist, Slightly plastic		235
24.0-25.5		·	Silty Sandy Peat (silt + Sand 30%; dry, Mad.	04	56 10

in the state of th	HPGW 2	4-		Location Coordinates N	
size_	6"	Slot	0.01	<u>E</u>	
Screen Size_	2"	Mat'1	PUL	Filter Materials Silver Sand	
asing Size_		Mat'1	PUC	Grout Type Bentonile Pellets	
ologist	David	Brent1.	790	Development	· -
Date Start_	11/13/86	Finish_	11/12	Static Water Level 6.83'	
Contractor_	<i>E</i> S8	, F		Top of Well Elevation 9.33'	
Driller	Davis	-	·	Drill Type Hollow Stem Aug	0

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/F
0.0-1.5		0.0-0.75	10 YR 2.5/1 Black, S. 1/2 Fine Sand 50% organic matter, saturated 1+20 10 YR 6.5/3 Pale - Very Pak Brown S. 1/4 Fine Sand Ls. 1+25%) 1005e, wet, Slight, dense	SM	4 3 4
.5- 3.0			Same as (0.75 - 1.5) less wet	5m	4 8 6
.0-4.5			104R 5/3 light Brown with Black-grey Silty Clay mettles throughout, Silty fine Sand (Silt 30%), moist non-plastin slightly wense	sm	5 9 7
1.5-6.0			, ,	SM	2 3 4
.o-7.5			1098 4.5/4 Yellow Brown - dark yellow Brown Silty Clayer Sand, (Silt + Clay 45%), Slahtly Planty - Planty Morst, Slanty Stray	SC Sm	3 4 7

WELL FACT SHEET

and the state of the

Well No. HPGW74-2 Date 6/8/87 Start 6/8/87 Finish 6/9/87
Total Depth of Boring Prior to Well Installation 80 ± /
Diameter of Boring 5
Water Level 14.67 (700 0800 6/9/87)
Total Length of Well at Installation 71.96 Height of Well Above Ground Level 3.3/ Total Depth of Well Below Ground Level 76.59 Total Length of Screen 20 76.59 from 76.59 BGL to 56.59 BGL Total Length of Riser 59.90 from 56.59 BGL to 3.31 AGL Sand Heave. Total Interval from BGL to BGL Filter Pack Total Interval 25 from 51.59 BGL to 51.59 BGL Bentonite Seal Total Interval 3 from 51.59 BGL to 48.51 BGL Grout Total Interval 46 Strop from 48.59 BGL to 0.59 BGL
Protective Casing Total Interval from BGL to AGL
Well Screen Dia. 2" Schedule 40 Slot Size 0.0/ Well Riser Dia. 2" Schedule 40 Filter Material Coare Sand Scal Defante
Backfill (danselle Cement CX Bentonite Water
Protective Casing Dia. Haterial
Well Development 6/10/47/ Date 6/16/87 Time 2 1315 Start 1330 Complete 1730 6/13/87 Water Level at Start 14.67 700 Finish 75.80 700 affer bail Conductivity Start Finish Water Color Start furbid 9184 Finish Clear (Bail) Start 6/18/87 Finish 6/13/87
Surge Start - Finish Finish (15/2) Volume 185.00 m/les
Pump Start 6/10/87 Finish 6/15/81 Volume 185.0 gallons Type Bailor Rate 0.15 gpm (PVC Sch. 40)

OVERBURDEN MONITORING WELL SHEET

ROJECT Camp Legeni - HPIA		LER ATEC
ROJECT NO. 49-62636 BOR	ING NO. HP-6224-2 DRILL	LING Med Rotary
ILEVATION DATE	E 6 8 8 + - 6 4 9 + DELV	FI OPMENT
IELD GEOLOGIST Him of the thinger	(ESE) METI	100 Bouling
		· _
	ELEVATION OF TOP OF	SURFACE CASING: _ 글여로
	ELEVATION OF TOP OF	RISER PIPE: 33.73
+	STICK-UP TOP OF SUR	
ROUND	STICK-UP RISER PIPE:	<u> </u>
LEVATION	TYPE OF SURFACE SEA	Li <u>convete</u>
H H ·		
. 1	I.D. OF SURFACE CASIN	G:
ии	TYPE OF SURFACE CAS	
ИИ	<u> </u>	<u> </u>
	1	2.0
и и	RISER PIPE I.D.	<u> </u>
	TYPE OF RISER PIPE:	Schedule Foric
A A-	BOREHOLE DIAMETER:	5"
	TYPE OF BACKFILL: Por	tiand #1 Comment
a a		
	ELEVATION/DEPTH TOP	OF SEAL: <u>45.7</u>
	TYPE OF SEAL: Bench	mite
	05071 700 05 0140 0	F. 5
	DEPTH TOP OF SAND P	
	ELEVATION/DEPTH TOP C	
	TYPE OF SCREEN: _ Sc1	
第三篇 	SLOT SIZE X LENGTH:	(01c, ×90,
	TYPE OF SAND PACK:	coarse send
三 二 三 三 三 三 三 三 三 三 三 三 三 三 三 三 三 三 三 三		
日二日		
	· ·	
第二世	FI EVATION (DEPTH BO	TTOM OF SCREEN: 76.5

<u></u>	ELEVATION/DEPTH BOT	
	TYPE OF BACKFILL BELL WELL:	OM OBSEKVATION
[
	ELEVATION/DEPTH OF H	IOLE SC'±
NOT TO SCALE		

		Profit and	•
Hole Size	Slot	HP(WZ4-L E	
Screen Size	Kat'1	Filter Materials	
asing Size	Kat'l	Grout Type	
Ç-nlogist		Development	•
e Start	Finish	Static Water Level	
Contractor		Top of Well Elevation	
Driller	·	Drill Type	<u> </u>

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FI
50 - 55			Silly Sonda - for l Sandy silt. With Clay + Small skells		
55-60			(lagey Silty fine sund mostly fine sund some Med Coarse rund - with small (lastics (shills)		
0-65			Sum as about 55-60 more shells		,
,,10	•	naid inte	Coarse Sand and uncerented	Rak T	
7º -75		1. that is The Thinks tone	(ots of shells) Same as above 70-75	Rak	
			Comments:	•	
		:	Rock layer is not very hard, driller went through passily.		
		-•			

Hole Size_	5"	Slo	0.01	146W24-Z	<u>E</u>		
Scrèen Siz	e 7"	Kat	1 PVC	Filter Materials	Coarse Sar	1 0	
asing Siz	e Z "	Kat	1 PVC	Grout Type #/	Portland	/	
Galogist_	David Bre			Development B	ailed (184 9	allons.)
). Start	6/8/87	Fin:	ish 6/9/87	Static Water Level	14.67	105	11.47.86
Contractor	. ESE			Top of Well Elevat			255
Driller		£ 155 00	catos	Drill Type Rof	ary - M	vd	stuk
	(Don S	weeting)			·	79.	40 TEC
Depth (feet)	Sample	Sketch	I	Athology, Color		uscs	SPI (BL/FI)
0-5			5.12	1 fine Sand	. •	·	
5-10		<i>-</i>	Silky	Fire sand	,		
10-15		•	Silty	fine Sund			
15-20			Silly we	y fine sound		-	
25	•		very fir	se sand			
75-30	•		very fine while fine well ro	Sund, some coar us, Coarse mu te unded	rich		Target and the second s
30 - 35 			iury fine Some as		•		-
35 - 40		-	very time	e silly-clayer fi	re Sund		_
· · 9-50			f -	as about 5-40 More Clay			

WELL NO. HP-6-24-3

OVERBURDEN MONITORING WELL SHEET

PROJECT Camp Legane - HPIA	DRILLER ATEC
PROJECT NO. 49-63636 BORING NO. HE	METHOD POST CONTRACT
FIELD GEOLOGIST David Dreatinger (FIE)	DELVELOPMENT DELLING
FIELD GCOCOGIST	METHOD
ELE'	ATION OF TOP OF SURFACE CASING: 32.92
ELE'	VATION OF TOP OF RISER PIPE: 3250'
sno	K-UP TOP OF SURFACE CASING: 2.3€"
	K-UP RISER PIPE: 2-34
ELEVATION	E OF SURFACE SEAL:
	·
	OF SURFACE CASING:
	E OF SURFACE CASING: _ciateonsteet
RISE	R PIPE I.D
TYP	E OF RISER PIPE: Schudule 40 PX
	EHOLE DIAMETER: 5
	and brancitic
TYP	E OF BACKFILL: Portland + Cement
	VATION/DEPTH TOP OF SEAL:
TYP	E OF SEAL: Dentruk Pollets
DEP	TH TOP OF SAND PACK:
[M] [M]	VATION/DEPTH TOP OF SCREEN: 125 /2
1 ····· ··· · · · · · · · · · · · · · ·	E OF SCREEN: Schedule 40 PVC
1	SIZE X LENGTH: (Coler x 200
f	E OF SAND PACK: nate at formetion
	(SIH-three-med sains)
	<i>y</i> .
	VATION/DEPTH BOTTOM OF SCREEN: 14812
	VATION/DEPTH BOTTOM OF SAND PACK: E OF BACKFILL BELOW OBSERVATION
WEL	
THE STATE OF THE S	VATION/DEPTH OF HOLE
NOT TO SCALE	
NOT TO SCALE	
The first of the second of the	OVBDMW.DW

Well No. HP6W24-3 - Date 7/1/87 Start 6/19 Finish 7/1
Total Depth of Boring Prior to Well Installation 155
Diameter of Boring 5
Water Level 10.5
the state of the s
Total Length of Well at Installation /50
Height of Well Above Ground Level /.83
Total Depth of Well Below Ground Level 148.17
Total Length of Screen ZO from 450 BCL to 128.17BCL
Total Length of Riser /30 (124:17 from 128.17 BGL to 1.83 AGL
Sand Heave. Total Interval None from BCL to BCL
Filter Pack Total Interval NONE from - BGL to - BGL
Bentonite Seal Total Interval 5-7 from 95 BGL to 84 BGL
Grout Total Interval 80 from 84 BGL to 24 BGL
Protective Casing Total Interval from BGL to AGL
Well Screen Dia. 2" Schedule #40 Slot Size 0.01
Well Riser Dia. Z' Schedule #40
Filter Haterial Natural Folmation (Silty Fine-Med. Sand)
Seal Bentonite Pellets
Backfill Coment Bentonite Water
Protective Casing Dia. Material
recective Cabing Dia.
Date 6/19 Time /600 pm Start 6/19 Complete 7/1
Water Color Start Finish 7/4
Start 6/19 Finish 7/1
Surge Start Finish Volume 300 gal
Type Rate Volume 500 gaz
A THE STATE OF THE

Hole Size	Slot og same	
Screen Size	Mat 1	Filter Materials.
asing Size	Kat'1	Grout Type
f plogist		Development
Start		Static Water Level
Contractor		Top of Well Elevation
Driller		Drill Type
		Top of Well Elevation Drill Type

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT)
140 - 145			silts fine- Med. Sand with. less she is + Rocks, not. much course sand		1
	- 45		Mo(4 (0079 5110	•	
J = 150			Some us about	,	
50-155			Silly fine - med. Sand little stell + rock		
					 :
- <u>-</u>	 				- ~-··
	•	.•			
•		 		Jm	· · · · · · · · · · · · · · · · · · ·
	The second state of the second	Annual and the second s	The state of the s		
1		•		•	
	•				-
•	THE SECTION AND ANALYSIS STREET, SECTION ASSESSED.			2. 48	
	••		***		·
					

Slot	<u>E HP6W74-3</u>
Kat'1	Filter Materials.
_Kat'l	Grout Type
	Development
_Finish	Static Water Level
	Top of Well Elevation_
	Drill Type
	Mat'l Mat'l Finish

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/F)
,55 - 115			Sitty five - Ve fine sand with shills + rock fragments		·
	•	; 		-	
. y : 115.		• 	Silly finesand and coarse sand with cemented clastics shells course sand angular, clear		
115 - 170		-	med: Sond, 50% Semi cemated clusters (944) and fossils, states		
			-		
(.0-125			Some = 45 above (115-120)	gar da	
-	•				•
125-130			Selly fine Sand with lots de shells + fosails, coarse rounded sond	- - - -	
130-135		-	same as Abort (127-17)		3
135-140		:	with cemated clastics		
			, issuit in the second	<u>.</u>	.
	•	-			

Hole Size	Slot	E 14P241-732-7
Screen Size	Kat'l	Filter Materials.
asing Size	Kat'l	Grout Type
G-nlogist		Development
.e Start	Finish	Static Water Level
Contractor		Top of Well Elevation
Driller	·	Drill Type

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPI (BL/FI
60-70	Sur d Stif Rock		V. little clay Coarse soud will coorder + small she		-
	1 0(4	68-70	amnted Clastics Limistone + Stells	very	Hurd
70 - 75		•	Rock (uncommed thestics) shells and coarse sond (well rounded). Fine silling sand (74-75) with 1005 cock are six 1:-		·
75 - 40			From Clay plas stees seg		
	50/t	Pack (1'2')	(85 - 84), Silly fine 5415		-
97 - 40	•		Silts very fine soul with small shells and rounded v. (oarse sand pebbles	- - -	
95 - 97		-	silty med. Sand with mine shelp are Goarse sand + pebbles		
					<u>. </u>
) = 10°			Sam es a con- (90-95)	·	·
100-103		100-103	Silty Fin Sano		
		103-104	solid cemented Lugar.		
,		1.1	, silly fine sura		

			
Hole Size	.5 "	Slot 0.01	E HPCWZ4-3
Screen Size_	Z ''	Hat'1 Pb⊂	Filter Materials Natural formation
asing Size	Z ''	_Kat'1PVC	Grout Type Portish of #
~ologist	Davin B.	entlinger	Development Boilor
Duce Start_	6/10/87	Finish 6/18/87	Static Water Level 11.97' B61
Contractor_c	558		Top of Well Elevation 1.81; 150 TOC
Driller Do	in Sweeting	(ATEC)	Drill Type Rotary - Mud

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/FT
0-10			top 5', some (lay layers	·	-
70-75		٠	silty fine sond and organic Cly throughout.	•	
15-20		-	silty fin - med. Sond with coarse sond + pebbles bo Hom 3'		
7) - <u>(</u>			Coarse sond TOP 5', Silty Clayey Gresond		
35 - 2 1			Sitty Fire Sond		
35-43		•	Silty Med Sond with clay luggers (clay brown with coarse sond)	-	
(3-55)	-		Some as abord (35-40) 1. He/nd Coorse moternal	•	
50-60			Silty med - Coase Sund Rock of 58' (cemented Clastics + Stells).		

APPENDIX F.6 BUILDING HP902 GEOPHYSICAL INVESTIGATION (BAKER, 1994) Figure A3-6 presents the results of the radar survey at the southeast corner of the building. Two tanks are interpreted at a depth of approximately three feet and possibly a third tank at a depth of six feet along the outside wall of the building. Figure A3-7 shows the radar record obtained along Line 0+85E, exhibiting large parabolic reflections characteristic of underground storage tanks.

Figure A3-8 presents similar results obtained at the southwest corner of the building, where two tanks are interpreted at a depth of approximately three feet and possibly a third tank at five feet. The two shallower tanks are located adjacent to fill caps observed at ground surface.

No tanks were detected on the Fir Street side of building 1502.

3.2.2 Building 1601

Tanks were reported at two locations surrounding building 1601: 1) along East Road at the southeast corner of the building and 2) along East Road at the southwest corner of the building.

Figure A3-9 presents the results of the radar survey at the southeast corner of the building. At least one and possibly two tanks are interpreted at a depth of five to six feet in the area delineated. Figure A3-10 shows the radar record obtained along Line 0+40E, exhibiting parabolic reflections characteristic of underground storage tanks at depths of five to six feet and a small, near surface pipeline or utility.

Figure A3-11 presents the results obtained at the southwest corner of the building. Radar coverage was restricted in this area due to the presence of several parked trailers. A possible tank or large utility was detected at a depth of two to three feet, northeast of the pump island.

3.2.3 Buildings 902 and 903

A single tank had been reported between buildings 902 and 903. Figure A3-12 presents the results of the radar survey in this area. One small tank is suspected at a depth of approximately two feet along the outside wall of building 902 near well 24-1. Figure A3-13 shows the radar record obtained along Line 0+10N, exhibiting large parabolic reflections

characteristic of an underground storage tank at a depth of two feet. No evidence of other tanks at buildings 902 or 903 was observed.

3.2.4 Buildings 1202 and 1709

A storage tank had been reported in the alcove on the backside of building 1202 and somewhere surrounding building 1709. Figure A3-14 presents the results of the radar survey at building 1202 which detected no evidence of an underground tank.

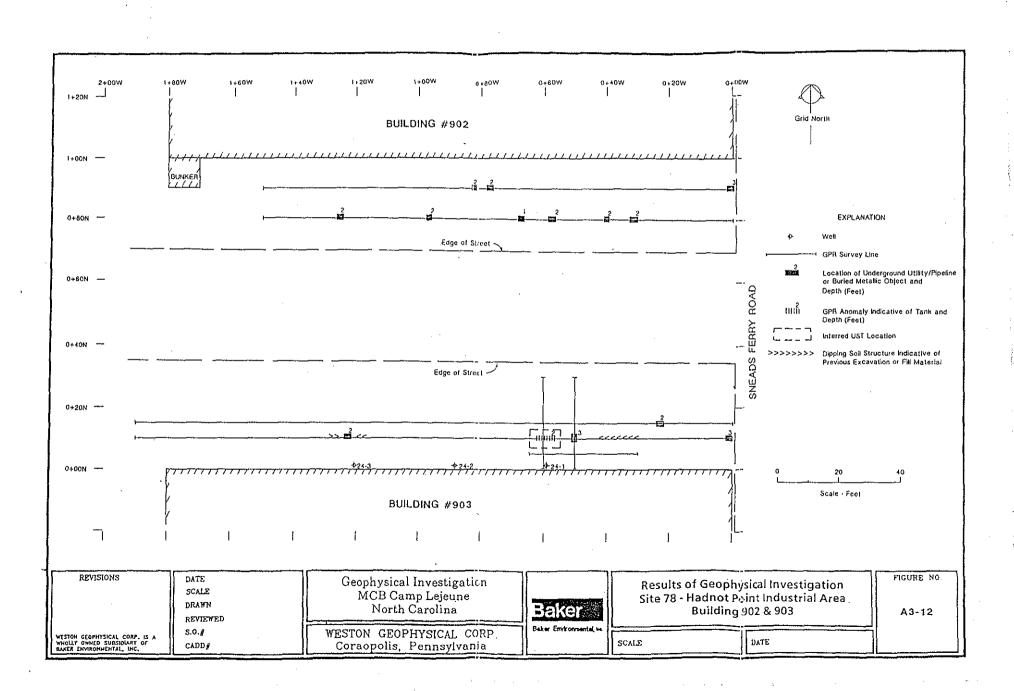
Similarly for building 1709, no tank is suspected. However, as shown on Figure A3-15, a large buried object or possibly a utility, was detected on the east side of the building. Likewise, on the west side of the building at 0+30S to 0+45S, two large, shallow objects were detected, which cannot be identified.

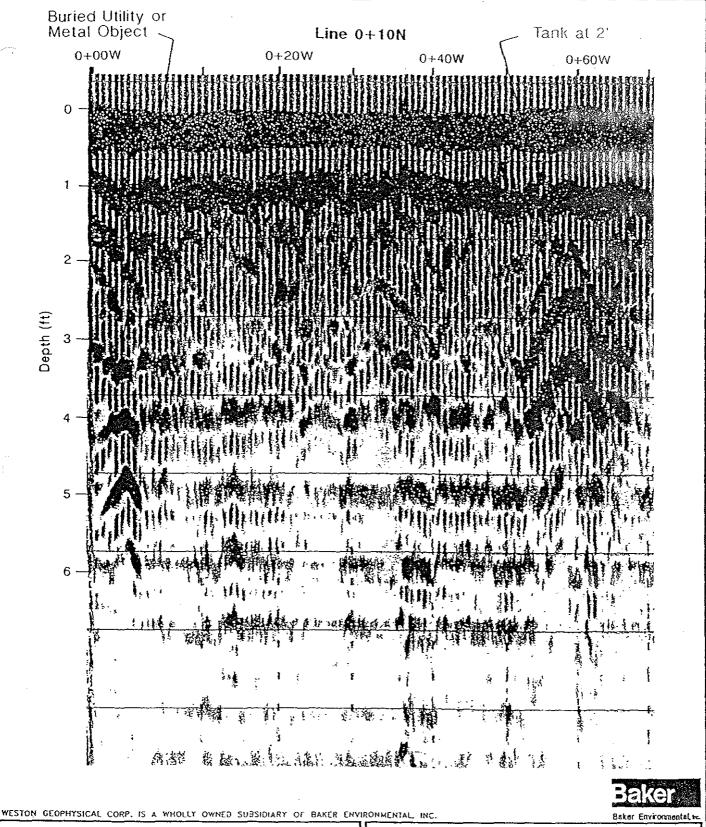
4.0 CONCLUSIONS

Multi-disciplinary geophysical techniques were effective in delineating limits of disposal at three separate areas on Sites 24 and in locating underground storage tanks at several buildings on Site 78.

At Site 24, the extent of spiractor sludge disposal was correlated with slightly elevated values of conductivity above measured background levels. The eastern boundary of fly ash disposal was defined by a distinct increase in conductivity, characteristic of fly ash material. Disposal at the borrow area was also delineated by increased values of conductivity. Locations of buried metal at all three disposal areas were identified for subsequent investigation via test pitting.

At Site 78, Hadnot Point Industrial Area, suspected locations of underground storage tanks were identified at buildings 1502, 1601, and 903. The presence of tanks at buildings 1202 and 1709 was not confirmed.





Geophysical Investigation MCB Camp Lejeune North Carolina

GPR Profile Site 78 - Building 903

WESTON GEOPHYSICAL CORP. Coraopolis, Pennsylvania

Date

Figure No. A3-13

APPENDIX F.7 BUILDING HP908 SOIL GAS INVESTIGATION (BAKER, JUNE 1994)

2.3.1.3 Results

Results of the soil gas survey are summarized on Table 2-4 and in Target's report which is provided in Appendix D. As shown on Table 2-4, the VOC concentrations ranged from not detected (ND) at several locations to 350.5 µg/l at Building 927. The most frequently detected VOCs included vinyl chloride, toluene, ethylbenzene, xylenes, TCE, PCE, 1,2-DCE, and 1,1-DCA. A brief summary of the compounds detected with the highest total VOC concentrations (i.e., sum of all detected volatiles) is presented below. Figure 2-2 depicts the locations of the buildings (i.e., sample points situated around the buildings) which exhibited the highest concentrations (not all buildings identified on figure) as discussed below. Soil gas samples collected near the following buildings exhibited the overall highest concentrations of VOCs.

- Building 907 Sample 907-4 with 53.5 µg/l total VOCs contained vinyl chloride and 1,1-DCA.
- Building 927 Sample 927-3 with 350.5 µg/l total VOCs contained ethylbenzene, and xylenes.
- Building 928 Sample 928-1 with 26 µg/l total VOCs contained toluene and xylenes.
- Building 1206 Sample 1206-4 with 10.9 µg/l total VOCs contained vinyl chloride, toluene, ethylbenzene, and xylenes. The sample with 35.2 µg/l total VOCs contained vinyl chloride, ethylbenzene, and xylenes.
- Building 1407 Sample 1407-4 with 243.7 µg/l total VOCs contained vinyl chloride only.
- Building 1505 Sample 1505-5 with 229.8 μg/l total VOCs contained vinyl chloride, and BTEX.
- Building 1775 Sample 1775-3 with 43.5 µg/l total VOCs contained vinyl chloride,
 1,1-DCE, ethylbenzene, and xylenes.
- Building 1780 Sample 1780-4 with 25.8 µg/l total VOCs contained ethylbenzene, and xylenes.

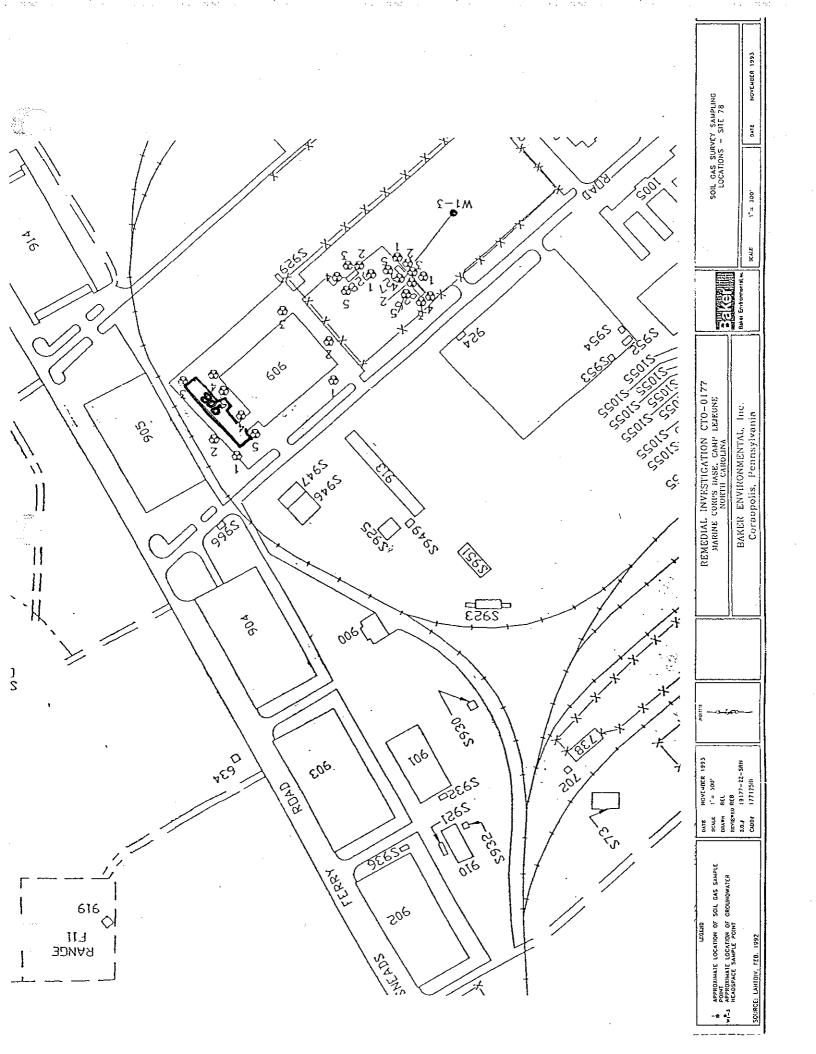
TABLE 2-4 SOIL GAS SAMPLE RESULTS TOTAL VOLATILE ORGANIC COMPOUNDS REMEDIAL INVESTIGATION CTO-0177 MCB CAMP LEJEUNE, NORTH CAROLINA

		1	JAMI LIBORIONE				
Soil Gas	Total VOC	Soil Gas	Total VOC	Soil Gas	Total VOC	Soil Gas	Total VOC
Sample	Concentration	Sample	Concentration	Sample	Concentration	Sample	Concentration
Number	(µg/l)	Number	(µg/l)	Number	(µg/l)	Number	(µg/l)
907-1	1	1012-1	ND	1450-1	1.2	1815-1	ND
907-2	3.7	1012-2	1.1	1450-2	6.3	1815-2	1
907-3	1.1	1012-3	ND	1450-3	1.5	1815-3	. 1
907-4	53.5	1012-4	ND	1450-4	1.4	1815-4	ND
907-5	ND	1012-5	1.1	1450-5	1.6	1815-5	ND
908-1	ND	1106-1	ND	1505-1	ND	1817-1	ND
908-2	ND	1106-2	2.7	1505-2	3.3	1817-2	3.7
908-3	2.8	1106-3	ND	1505-3	6.2	1817-3	ND
908-4	3.2	1106-4	ND	1505-4	ND	1817-4	3
908-5	ND	1106-5	ND	1505-5	229.8	1817-5	ND
909-1	2.9	1116-1	ND	1604-1	1.4	1826-1	ND
909-2	ND	1116-2	2.1	1604-2	ND	1826-2	5.7
909-3	3.1	1116-3	1.7	1604-3	1.8	1826-3	1
909-4	1.4	1116-4	ND	1604-4	2	1826-4	ND
909-5	4.4	1116-5	1.5	1604-5	1.2	1826-5	9.2
915-1	1	1117-1	1.1	1765-1	3	1828-1	ND
915-2	2.7	1117-2	2.9	1765-2	3.6	1828-2	7.2
915-3	1.5	1117-3	1.7	1765-3	7.2	1828-3	1.9
915-4	5.8	1117-4	1.1	1765-4	NA	1828-4	2,9
915-5	3	1117-5	ND	1765-5	1	1828-5	ND
916-1	1.2	1205-1	5.3	1775-1	2.4	1829-1	1.5
916-2	7.6	1205-2	1.1	1775-2	2.6	1829-2	ND
916-3	1	1205-3	1.1	1775-3	43.5	1829-3	5.4
916-4	3	1205-4	7.4	1775-4	1.4	1829-4	3
916-5	4.1	1205-5	5.3	1775-5	1.2	1829-5	2.5
926-1	ND	1206-1	9.6	1780-1	2.9	1841-1	14
926-2	ND	1206-2	6.1	1780-2	ND	1841-2	4.6
926-3	ND	1206-3	1.8	1780-3	ND	1841-3	1.1
926-4	ND	1206-4	10.9	1780-4	25.8	1841-4	ND
926-5	1.8	1206-5	35.2	1780-5	1.1	1841-5	16.6
927-1	ND	1310-1	ND	1804-1	ND	1854-1	7.9
927-2	7.4	1310-2	2.5	1804-2	ND	1854-2	10.3
927-3	350.5	1310-3	ND	1804-3	22.6	1854-3	NA NA
927-4	1.1	1310-4	8.6	1804-4	1.1	1854-4	2.6
927-5	ND	1310-5	8.4	1804-5	ND	1854-5	1.1
928-1	26	1407-1	ND	1808-1	ND	1860-1	1.5
928-2	ND	1407-2	ND	1808-2	ND	1860-2	ND
928-3	1.2	1407-3	ND	1808-3	ND	1860-3	4.8
928-4	ND	1407-4	243.7	1808-4	ND	1860-4	ND
928-5	ND	1407-5	ND	1808-5	ND	1860-5	ND
1011-1	ND	1408-1	5.8	1810-1	165	1880-1	ND
1011-2	7.9	1408-2	1.1	1810-2	9.9	1880-2	ND
1011-3	1.1	1408-3	ND	1810-3	ND	1880-3	ND
1011-4	1.5	1408-4	ND	1810-4	ND	1880-4	1.4
1011-5	4.5	1408-5	ND	1810-5	ND	1880-5	ND
YATT-0	4.0	1 4200-0		7070-0		1 1000-0	MD

Notes: NA = Sample not collected or analyzed

Total VOC concentration is equal to the sum of all detected volatiles including halogenated (e.g., vinyl chloride, TCE) and non-halogenated (e.g., BTEX) compounds.

2-19



APPENDIX F.8 BUILDING HP908 MONITORING WELL INSTALLATION (BAKER, JUNE 1994)

Baker Environmental, has

B - 61

RIG:

The state of the s

TEST BORING AND WELL CONSTRUCTION RECORI

PROJECT: Site 78 Hadnot Point Industrial A	rea	
S.O. NO.: 19177	BORING NO.: 78 - GW 33	

COORDINATES: EAST: 2503/64.1 NORTH: 339946.7
ELEVATION: SURFACE: 39.9
TOP OF PVC CASING: 29.84

		SPLIT SPOO		CASING	AL	JGERS	CORE BARREL	DATE	PROGRESS (FT)	V	VEAT	HER	,	WATER DEPTH (FT)	TIM	ΙE
SIZE (DI	AM.)	1 3/8"	ID	4.0"	81	/4" ID		5-18-93	14	clo	oudy	75	.0	6	11:40	<u> </u>
LENGTH	1	2.0'	$\neg \top$			5.0					7					_
TYPE		Std.		PVC Sch 40	- 1	HSA										
НАММ	ER WT.	140#	#	-												
FALL		30"														
STICK U	P							1								
REMAR	KS:	 -					··	 								
	<u>S.</u> = Split Spo = Shelby T		A =	Auger Wash			/ELL RMATION	DIAM	777	E			DE	OP PTH FT)	BOTTO DEPT (FT	TH
R =	= Air Rota = Denison	ry	C =	Core Piston		Well C	asing	4.0"	PVC Sch 40						4.0	7
		= No Sa		TBON		Well S	creen	4.0"	PVC Sch 40 - 10 S	lot			4.	.07	13.1	
Depth (Ft.)	Sampl Type and No.	Samp. e Rec. Ft. &	SPT or RQĐ	Lab. Class. or Pen. Rate	PID (ppm)		Visual (Descriptic	on		lr	We stall Det	lation	n	Eleva	tío
		12"	6			3" A	sphalt		, ,	1		1			-	
1 –	S-1	50%	10			5" SA	ND five a	ind SILT	jbrownjdry - black oganici jgray jdampi-	12	7	2			7	
2 -	_	20#	5	 		1016 S.	ND fine t AND fine t	race SILT	igray idampi.	┼—	\				-	
3	S-2	.	5			Ruc	omnight,	1005€	-]					4	
4		82%		<u> </u>		1			ar , gray , damp	1					1	
5	S-3	20"	3			SAN	D five tr	ace SIL	T *LAB SAMPLE HOM, TAN +GEL	, ,		5			1 _	_
	12.2	83%	6	1		100	se inquis	$t \cdot$]]			7	
6	_	20"	3	1		SANI	D fine fr	WATER AT	r 6'	1	8				1	
7 -	S-4	1	4			TAN	at To	· HLAB	st Bottom .	-					4	
8 —		83%	6	 	 	1 mg	or loose	· *LAB	SAMPLE	4					4	
9 -																
-	A-A	'				1				1					-	
1.7	ļ	1	1	- [atch to Sheet 2	7		1			7	

DRILLING CO.: Hardin Huber

BAKER REP.: Ken Tua & Robert Lewis

DRILLER: Tom Kramer & Terry Mise

BORING NO .: 78 - GW33

SHEET $\underline{1}$ OF $\underline{2}$

Baker

TEST BORING AND WELL CONSTRUCTION RECORD

Baker Environmental, Inc.

PROJECT: Site 78 Hadnot Point Industrial Area

S.O. NO.: 19177 BORING NO.: __78 - G \u033

SAMPLE TYPE DEFINITIONS

S = Split Spoon A = Auger SPT = Standard Penetration Test (ASTM D-1586) (Blows/0.5')

T = Shelby Tube W = Wash RQD = Rock Quality Designation (%)

R = Air Rotary C = Core

Lab. Class. = USCS (ASTM D-2487) or AASHTO (ASTM D-3282)

P = Piston

PID = Photoionization Detector

on P = Piston PID = Photoionization Detector
N = No Sample

		= NO 2a	mbie								
Depth (Ft.)	Sample Type and No.	Samp. Rec. (Ft. & %)		Lab. Class. or Pen. Rate	PID (ppm)	Visual Description	١	Well Installation Detail		Elevation	
-						Continued from Sheet 1		1		,	
11-	A-N					.	1	8			1
12		20"	9			SAND five trace SILT -	5	1	5	_]
13_	5-5		9			SAND five trace SILT gray swet, medium douse	1			_	1
14——		83%	ш	· 			1_	7			
15						END OF BORING 14'	-				
16-	į									-	1
						<u>-</u>	1			-	}
17-							-			_	
18-						- -				_	
19_						<u>.</u>	1				
20							-				1
21_			:	:		-]			-	
						- -	1			_	1
22						-	-			-	-
23 -						-]			- -	1
24					[1			_	1
25 _							-				-
26_]			-]-
						-	1			-	1
27 _							-				-
28						<u>-</u>]			-	1
29_							_				1
(30_						Match to Sheet 3	-			_	-

DRILLING CO.: Hardin Huber

DRILLER: Tom Kramer & Terry Mise

BAKER REP.: Kenneth A. Tua & Robert Lewis

BORING NO.: __ 78 - GW 33 SHEET 2 OF

Table 4 - 25 Operable unit no. 1 - site 78 Hadnot point industrial area Subsurface soil positive detection summary Remedial investigation cto - 19177 MCB CAMP LEJEUNE, NORTH CAROLINA ORGANIC CHEMICALS

SAMPLE NO. DEPTH UNITS	78-B903-SB01-02 4-5' UO/KO	78-B903-SB02-02 5- 6' UG/KG	78-B903-SB03-02 4-5' UG/KG	78-GW33-02 2-4 UO/KG	78-GW34-02 4-6 UO/KG	78-GW35-05 10-12' UG/KG	78-GW35-06 12-14' UG/KG
<u>volatiles</u>							
•				•		,	
ACETONE 1,2-DICHLOROETHENE (total) TOLUENE ETHYLBENZENE XYLENES (total)	26	110 6 J	40 16	59	21	30 ,	30
<u>SEMIVOLATILES</u>							
NAPHTHALENE 2-METHYLNAPHTHALENE		74 1					
ACENAPITTHENE PHENANTHRENE ANTHRACENE		97 J 590 150 J					
CARBAZOLE DI-N-BUTYLPHTHALATE FLUORANTHENE		89 J 700					at .
PYRENE UENZO(A)ANTI IRACENE CHRYSENE		480 320 J 300 J					
BIS(2-ETHYLHEXYL)PHTHALATE DI-N-OCTYL PHTHALATE		170 J					
BENZO(B)FLUORANTHENE BENZO(K)FLUORANTHENE BENZO(A)PYRENE		190 J 170 J					•
INDENCX (1,2,3-CD)PYRENE BENZCX OHI)PERYLENE		100 J 95 J				.,	·

Table 4 - 25 Operable unit no. 1 - site 78 Hadnot point industrial area subsurface soil positive detection summary remedial investigation cto - 19177 MCB CAMP Lejeune, north carolina Organic Chemicals

SAMPLE NO.	78-B903-SB01-02	78-B903-SB02-02	78-B903-SB03-02	78-QW33-02	78-GW34-02	78-GW35-05	78-GW35-06
DEPTH	4-5'	5-6'	4-5'	2-4'	4-6	10-12'	12-14
UNITS	UG/KG	UO/KO	UO/KO	UG/KO	UO/KO	UG/KG	UG/KG

PESTICIDES/PCBS

DELDRIN

4,4'-DDE

4,4'-DDD

4,4'-DDT

Table 4 - 7
Operable Unit No. 1 - Sites 21, 24, 78
GROUNDWATER POSITIVE DETECTION SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL TOTAL METALS AND CYANIDE

	SAMPLE NO.	78-GW31-3-01	78-GW32-2-01	78-GW32-3-01	78-GW33-01	78-GW34-01	78-0W35-01	78-GW36-01
	UNITS	UG/L	UG/L	UG/L	Ua/L	UG/L	UG/L	Uar
ALUMINUM		1200	112000 J	539 J	78200	6870	47100	120000
YNOMITAA								
ARSENIC			21.6 J		5.6 J	4,4 J		3.1 J
BARIUM	•	415	476	42 B	162 B	173 B	261	152 B
BERYLLIUM		1 B	10	1 B	1 B		1 B	
CADMIUM			10					
CALCIUM		308000	94600	5440	64800	10400	7480	35400
CHROMIUM		21	215 J		65		55	111
COBALT			. 84					
COPPER		5 B	87		20 B	11 B	15 B	29
RON		72 B	98500 J	112 J	14900	7250	11800	21200
LEAD			146		18.1	5.5	13.2	30.2
MAGNESIUM		151 B	13700	319 B	7290	2880 B	5680	5740
MANGANESE		2 B	328		86	96	57	62
MERCURY			0.3					0.3
NICKEL			166		20 B		•	24 B
POTASSIUM		61600	8460	67300	6900	2620 B	6150	5820
SELENIUM		1.7 J	99.5 J		12.8 J		3.5 J	1.7 J
SILVER								
SODIUM		26100	7510	42500	7030	4070 B	10300	2450 B
MULLIAHI			7.3 1	1.3 J				
MUIDANAV		10 J	462	5 B	74	15 B	59	98
ZINC		10 J	826]		37	59	30	57

ug/L - microgram per liter

J - value in extimated

B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL)

TABLE 4 - 26 OPERABLE UNIT NO. 1 - SITE 78 HADNOT POINT INDUSTRIAL AREA SUBSURFACE SOIL POSITIVE DETECTION SUMMARY REMEDIAL INVESTIGATION CTO - 19177 MCB CAMP LEJEUNE, NORTH CAROLINA TAL METALS AND CYANIDE

	SAMPLE NO.	78-B903-SB01-02	78-B903-SB03-02	78-GW33-02	78-GW33-03	78-GW34-01	78-GW34-02
	DEPTH	5-6'	4-5'	2~4'	6-8'	2-4'	4-6'
	UNITS	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG	MG/KG
ALUMINUM		6760 J	8550 J	6570	4280	2730	12600
ARSENIC		1.9 B	0.74 B	0.86 B		6.2	
BARIUM		10.6 B	11.3 B	4.4 B	4,6 B	2.8 B	12.7 B
BERŸLLIUM			0.26 B				•
CALCIUM		73.5 B	124 B	293 B	168 B	297 B	129 B
CHROMIUM		7.2 J	9 J	7.1	4.3	4.7	18.5
COPPER		1.2 B	0.51 B	1.2 B	0.72 B	0.7 B	3.4 B
IRON		4010 J	4690 J	5890	1950	3940	2120
LEAD		6.5 J	2.6 J	2.9 J	2.6 J	2.1 J	4,5 J
MAGNESIUM		156 B	157 B	193 B	220 B	106 B	458 B
MANGANESE		1.9 B	· 2 B	4.2	4.1	1,6 B	9.2
POTASSIUM		145 B	125 B	187 B	222 B	155 B	780 B
SELENIUM		0.29 J	0.38 J	0.34 J		0,26 J	1.2 J
SODIUM		93 B	30.2 B	42.3 B	41 B	31.9 B	51,7 B
VANADIUM		11.8 B	19.2	8.8 B	6 B	8.4 B	18.7
ZINC		1.7 B	2 B	2.9 B	1.9 B	1.6 B	7.9

mg/kg - milligram per kilogram

J - value is estimated

B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL)

APPENDIX F.9 BUILDING HP1120 MONITORING WELL INSTALLATION (BAKER, JUNE 1994) NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION P.O. BOX 27687 - RALEIGH.N.C. 27611, PHONE (919) 733-5083

Su 16

14. REMARKS: __

WELL CONSTRUCTION RECORD	į.	nor Basin	
	1 ·		GW-1 Ent
DRILLING CONTRACTOR DOUIS Drilling (O. DRILLER REGISTRATION NUMBER Pending	STATE WE	ELL CONSTRUCTION UMBER: _66~0	DN 135-WM-014
1. WELL LOCATION: (Show sketch of the location below) Nearest Town: Tack Son ville, N.C.	County:(onslow	<i></i>
(Road, Community, or Subdivision and Lot No.)	Depth From Jo	_	DRILLING LOG
2. OWNER 05 /Vavy	1,5-3,0		Sandy Clay
ADDRESS (Street or Route No.) 28542 City or Town State Zip gode	3,0-4,5	5 5//2	Clayey Gine So Fine Sond
3. DATE DRILLED 11/19/86 USE OF WELL Monitor	6-0-7-5	5 50% lag	
4. TOTAL DEPTH 25.5 CUTTINGS COLLECTED 2 Yes No	7.5-100	<u>and Silk</u> Silka	VITTE FIRE S
5. DOES WELL REPLACE EXISTING WELL? Yes PNo 6. STATIC WATER LEVEL: 12.04 FT. above TOP OF CASING, TOP OF CASING IS 2.5 FT. ABOVE LAND SURF. CE.	14.0-151.		re-Med Sandy
7 FLD (gpm): METHOD OF TEST	34,0 -25.	5 SI/14 (layer Kine -
8aTER ZONES (depth):			SUNDI
9. CHLORINATION: Type Amount			
10. CASING:		tional space is neede	ed use back of form.
Depth Diameter or Weight/Ft. Material	(Show direction	LOCATION S	
From To Ft	or other map	reference points)	
11. GROUT:	•		
From 0.0 To 2.0 Ft. Concrete From -2.0 To -3.0 Ft. C/3.4	<u> </u>	see Fig.	(2-5)
12. SCREEN:			
Depth Diameter Slot Size Material From $\frac{50}{50}$ To $\frac{25}{5}$ Ft. $\frac{21}{21}$ in $\frac{0}{0}$ (in.			
From To Ft in in.		÷	
From To Ft in			
Deoth Size Material	÷		
From -310 to -25 Ft. CO212 3010	/		
FromToFt			

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C. WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WEST OWNER.

FOR OFFICE USE ONLY

_____ Serial No. ____ __ Long. _____ Pc .

Quad. No. _

SIGNATURE OF CONTRACTOR OR AGENT

!	HPGW.11	, 2	_ Location Coo
	6"	Slot 0.0/	<u>.</u> :
n Size	z "	Mat'1 PUC	_ Filter Mater
sing Size		Yat'l PUC	Grout Type
- Gasiogist	David	Brentlinsor	_ Development_
	11/19/86		_ Static Water
Contractor		SE	Top of Well
Driller	0	avis	Drill Type

and the second s

Location Coordinates N	
<u>E</u> _	
Filter Materials S. hia	Sand
Grout Type Gen You	& Fores
Development	
Static Water Level	12.04'
Top of Well Elevation_	14.54 ′
Drill Type 40//our	Stem Auger
•	(/

Depth (feet)	Sample	Sketch	Lithology, Color	uscs	SPT (BL/FT
0.0-1.5			104R 3.25/1 Very Bark Gry, Silty Fine Sand (silt 30%) organic matter top 8", loose, Moist, non plastic	SM	3 3 5
1.5-3.0			2.54 5/6 light Olive Brown Silly Sandy Clay (Silt + Sand 45%) Slightly Plactic, Morst, Slightly Lense	SC	3/5
3.0-4.5			2.54 6/6 oline Yellow, Silly Clayey Fine Sand (Silt+ Clay 45%), Non Plastic, most, Slightly dense	SM	} /2 3
4.5-6.0			10 4R 6.75/4 40/low - Very Pole Yellow, Silly Fire Sand, (silt 30%), loose, moist, non phism	SM	763
6.0-7.5	Alternating 2-3 layers the oxideal	50%	1000 1000 month of the Sand 1000 month, non fine 104R 8/1 while white of the 2010 10000 month, little 10 no Silt	₹ W .	5 9 12

iw 16	Location Coordinates N
Slot	<u>E</u>
Mat'1	Filter Materials
Mat'1	Grout Type
	Development
Finish	Static Water Level
·	Top of Well Elevation
	Drill Type
	Slot Mat'1 Mat'1

Depth (feet)	Sample	Sketch	Lithology, Color	USCS	SPT (BL/F
7.5-9.0			rope 7.5/6 Yellow - Very Pale Yellow, Silty Ultra Fine Sand (silt 20%), loose - Slightly dense, moist, non plastic	SM SW	9 12 10
9.0-10.5		-	Some as above (7.5-9.0) with less Silt	SW	10 12 15
4.0 -15.5	•		1042 7,25/1 Light Grey While Silty Fire Soud, (Silt 25%), moist-well, loose, non Plastic, 10% Clay loyers	SM	664
19.0-20.5		·	1082 5.518, Yellow Brown, Silty ring-Med. Sandy Clay, (Silt + Sana 45%) wet, Sticky+ Plastic, Clay very plastic, Shighty sense	Sc	340
24-0 - 25. <i>s</i>			1092 7.5/1 white-light 6 My, Silty Clayer Fine- Med. Sand, (silt t Clay 45%) Clay layers polastic, with Slighty Janes	J.C.	3 8 16
_		-			

Boring No. HP6W 16		SHEET	
	1110101	•	
on Sik 1050 1" Spnnn 1100 Past Spnn 1130 Well Complete 1150	11/19/86		 -
Spoon 1700			
110/1 Carol b 1150			
coer confine 1130	·		
			 -
·			
Standard Well Speas		· · · · · · · · · · · · · · · · · · ·	
* there is no well point		· · · · · · · · · · · · · · · · · · ·	1
Standard Usell Speas * Here is no well point rother sliding cap at			
base of Casing			10
			7
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	120	12	<u>; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; </u>
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		-	
	DATE	SIGNED	

SOURCE: Environmental Science and Engineering, Inc.,

TABLE 4 - 7
OPERABLE UNIT NO. 1 - SITES 21, 24, 78
GROUNDWATER POSITIVE DETECTION SUMMARY
REMEDIAL INVESTIGATION CTO - 19177
MCB CAMP LEJEUNE, NORTH CAROLINA
TAL TOTAL METALS AND CYANIDE

	SAMPLE NO.	78-GW11-01	78-GW12-01	78-OW13-01	78-GW14-01	78-OW15-01	78-GW16-01	78-GW17-1-01
	UNITS	UG/L	· UG/L	UG/L	ሀር/L	UG/L	UG/L	UG/L
ALUMINUM		332000	108000 J	61800 J	103000 J	205000 J	341000 J	168000 J
ANTIMONY								
ARSENIC			9.6 J	38.3	18.4 J		19 J	11,6 J
BARIUM		631	155 B	236	321	469	511	261
BERYLLIUM		5	2 B	3 B	1 B	4 B	. 6	4 B
CADMIUM								, ,
CALCIUM		9130	31200	4040 J	5300	29100	62700	86900
CHROMIUM		412	114 J	222 J	113 J	215 J	353 1	200 J
COBALT				20 B		9 B	13 B	9 B
COPPER		84	30	18 B	33	49	80	40
RON		120000	26400 J	61800 J	49600 J	43300 J	10900 J	48700 J
LEAD		195	35.5	26.4 J	63	53	224	81
MAGNESIUM		15400	7220	11800	10600	13400	10800	9940
MANGANESE		174	47	57 J	68	115	150	96
MERCURY		0.75		t 2.0	0.38		0.38	
NICKEL		79		40	34 B	29 B	61	30 B
POTASSIUM		13000	6090	8210	6460	12000	14000	11600
SELENTUM		12 J	3.6 J	4.7 B	12.4 J	2.1 J	14.5 J	
SILVER	·							
SÓDIUM		3490 B	5420	15000	15400	6410	4120 B	3180 B
THALLIUM						1.1	1.4 J	1.1
VANADIUM		526	145	158	122	248	371	289
ZINC		120 J	64 J	96 1	51 J	116 J	157 J	98 J

ug/L - microgram per liter

I - value is estimated

B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL)

TABLE 4 - 8 OPERABLE UNIT NO. 1 - SITES 21, 24, 78 GROUNDWATER POSITIVE DETECTION SUMMARY REMEDIAL INVESTIGATION CTO - 19177 MCB CAMP LEJEUNE, NORTH CAROLINA TAL DISSOLVED METALS

	SAMPLE NO.	78-GW15D-01	78-0W16D-01	78-GW17-1D-01	78-GW17-2D-01	78-GW19D-01	78-GW20D-01	78-GW21D-01	78-GW22D-1-01
	UNITS	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
ALUMINUM		37 B	22 B		70 B	405	151 B	30 B	231
ANTIMONY			11.1 B	7 B	9.5 B				
ARSENIC							8.5 B		21.6
BARIUM		46 B	6 B	29 B	46 B	87 B	47 B	41 B	57 B
BERYLLIUM							1 B	i B	
CADMIUM				_					
CALCIUM		21700	43100	78300	116000	3940 B	4720 B	41600	32200
CHROMIUM									
COBALT									
COPPER							5 B	3 B	17 B
RON				53 J	1070 J	693 J	45200	160	15400 J
LEAD								•	17.2
MAGNESIUM		5560	1220 B	3720 B	2500 B	5660	6090	7210	4880 B
MANGANESE		5 B			32	27	18	41	53
MERCURY									•
MCKEL									
MUISSATOS		2080 B	472 B	1430 B	1560 B	1940 B	1370 B	2180 B	5400
SELENTUM		1.5 J	4.5 B						1.9 B
SODIUM		5940	3610 B	3040 B	9070	24000	11900	8190	9890
TIMLLIUM									
VANADIUM						•	4 B	•	
ZINC		6 B				7 B	25	17 B	7 B

ug/l. - microgrum per liter

J - value is estimated

B - reported value is less than Contract Required Detection Limit (CRDL), but greater than Instrument Detection Limit (IDL)

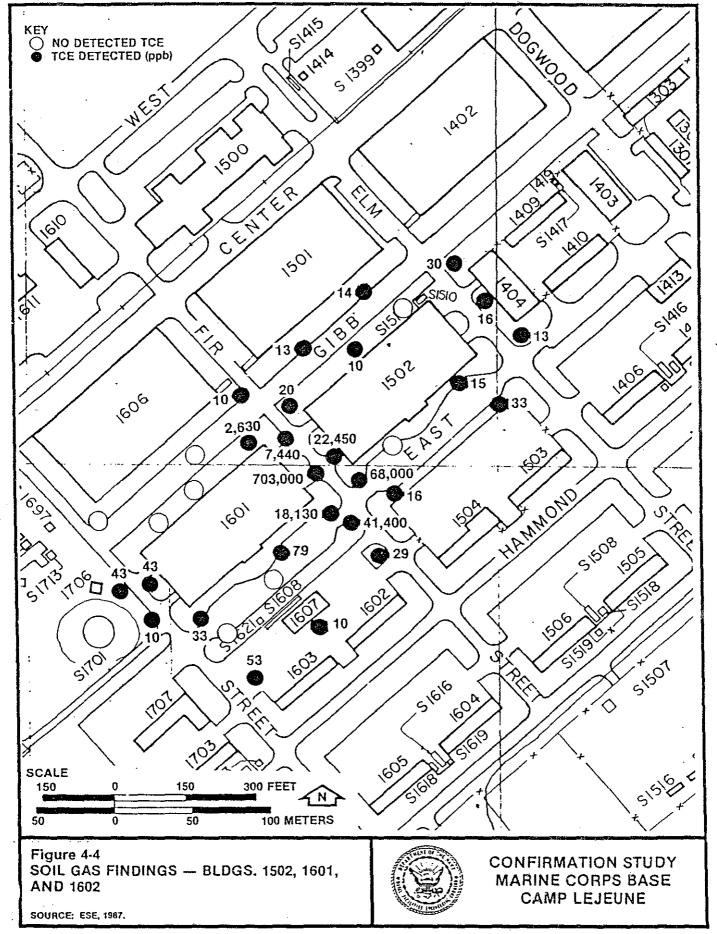
APPENDIX F.10 BUILDINGS HP1409 AND HP1512 SOIL GAS INVESTIGATION AT NEIGHBORING BUILDING HP1502, HP1601 AND HP1602 (ESE, APRIL 1992) TCE was detected in the soil vapors over a major portion of the western and northwestern areas of the Bldg. 1202 complex, with values ranging from 15 to 36,770 parts per billion (ppb). The highest concentrations were located at the northern and southwestern ends of the building. This corresponds closely with use and disposal history of solvents at this facility. A single value of TCE was detected on the eastern side of Bldg. 1300, but may be related to the TCE seen throughout the western side of Bldg. 1202 and adjacent facilities. Installation of monitor wells in this study site was required in order to identify/quantify potential VOC contamination in the groundwater.

4.2.4 Bldgs, 1502, 1601, and 1602

The area encompassed by Bldgs. 1502, 1601, and 1602 has been a vehicle maintenance and repair facility since initial construction (circa 1942-1943). The IAS identified the presence of a 440-gal underground storage tank of TCE at Bldg. 1601, the current status of which is unknown. Confirmation Study records search documented heavy solvent and petroleum, oil, and lubricant (POL) usage. In addition, heavy ground staining was The results of the soil gas investigation (Fig. 4-4) strongly corroborate the records search data. The soil vapors in the area between Bldgs. 1601 and 1502 are highly contaminated with TCE, with levels as high as 703,000 ppb. In addition, soil gas sampling stations on all sides of Bldg. 1502 recorded TCE contamination. Similarly, TCE contamination was detected at sampling stations on the southern and eastern sides of Bldg. 1601. High levels of TCE contamination in the soil adjacent to these buildings resulted in a high-priority classification of this study site in the following investigative efforts. Installation of a monitor well network was warranted.

4.2.5 Bldgs. 1709 and 1710

The area encompassing Bldgs. 1709 and 1710 (Fig. 4-5) has been a combat vehicle maintenance area, paint shop, and general maintenance area for much of its history. Underground "waste" tanks were identified at Bldg. 1709; the current status of these tanks is not known. Bags of soil



APPENDIX F.11 BUILDINGS HP1409 AND HP1512 SOIL BORING AT NEIGHBORING BUILDINGS HP1502, HP1601 AND HP1602 (ESE, APRIL 1992)

Pesticide compounds were detected in samples from two soil borings (HPSB-11 and HPSB-15). In boring HPSB-11, these compounds included Arcchlor-1260 (0 to 2 feet 290 mg/kg and 4 to 6 feet 670 mg/kg), heptachlor epexide (12 mg/kg 2 to 4 feet), endosulfan I (16 mg/kg 2 to 4 feet), and 4-4'-DDT (22 mg/kg 2 to 4 feet). Three compounds were detected in the sample collected from 0 to 2-feet depth in HPSB-15. These compounds were dieldrin (38 mg/kg), 4,4'-DDE (97 mg/kg), and 4,4'-DDT (140 mg/kg).

Select metals (aluminum, calcium, magnesium and iron) were abundant in two of the three soil samples analyzed in concentrations greater than 1,000 mg/kg. Many of the other metals analyzed for were also detected, with some being detected in concentrations below the certified detection limit. TCLP analysis of 29 samples showed detectable quantities of virtually all analytes with the exception of mercury and silver. There was one detectable concentration of mercury (1.0 mg/kg) in the sample collected from 4 to 6 feet in HPSB-11. Those analytes which were detected typically were detected in concentrations below the certified detection limit.

Building 1602

Soil borings H3SB-21 through HBSB-30 were completed in the vicinity of this building. TCB was detected in high concentration on all sides of this building during the soil gas investigation. The locations of these soil borings is presented in Figure 3-3. Analytical bits for volatile, semi-volatile and pesticide compounds are presented in Table 5-3. Full soils analytical data are presented in Appendix H.

A total of 33 samples were collected and analyzed for volatile organic compounds. Three of these samples were collected in duplicate for QA purposes. Methylene chloride and/or Acetone were detected in 32 of these samples. These compounds were mainly reported as UICs or were also found in the accompanying analytical field blanks. Both these compounds are routinely used for laboratory analysis or glassware cleaning and are not chemicals used routinely at the HPIA. They therefore are assumed to be laboratory comaminants. No other quantifiable concentration of

volatile contaminants analyzed for were detected in any of these samples. Other unquantifiable VOC's included chloromethane (HPSB-22), TCE (HPSB-25 and HPSB-26), 2-hexanone (HPSB-24) and 4-methyl-2-pentanone (HPSB-27).

Neither of the two samples analyzed for semi-volatile compounds revealed any quantifiable concentrations. Four unquantifiable UICs were identified in one of the borings (HPSB-30).

Pesticide compounds were detected in the shallow sample (0 to 2 feet) from one soil boring (HPSB-23). These compounds included Dieldrin (92 mg/kg), 4,4'-DDE (78 mg/kg), and 4,4'-DDT (40 mg/kg).

Select metals (aluminum, calcium, and iron) were abundant in both soil samples analyzed in concentrations greater than 1,000 mg/kg. Many of the other metals analyzed for were also detected, with some being detected in concentration below the certified detection limit. TCLP analysis of 29 samples showed detectable quantities of virtually all analytes with the exception of mercury and silver. Those analytes which were detected typically were detected in concentrations below the certified detection limit.

5.3 GROUNDWATER INVESTIGATION

The 27 shallow groundwater monitoring wells at HPIA were sampled faree times in 1987 (January, March, and May). The groundwater samples were analyzed for VOCs (EPA Method 624 parameters), lead and oil & grease. All shallow wells were again sampled in 1991 and samples were analyzed for full Target Contaminant List (TCL) parameters. Shallow well HPGW18 could not be sampled as it could not be located after numerous attempts to find it. All monitoring well locations within the HPIA are shown in Figure 3-4. A comparison of shallow groundwater volatile analytical bits is presented in Table 5-4.

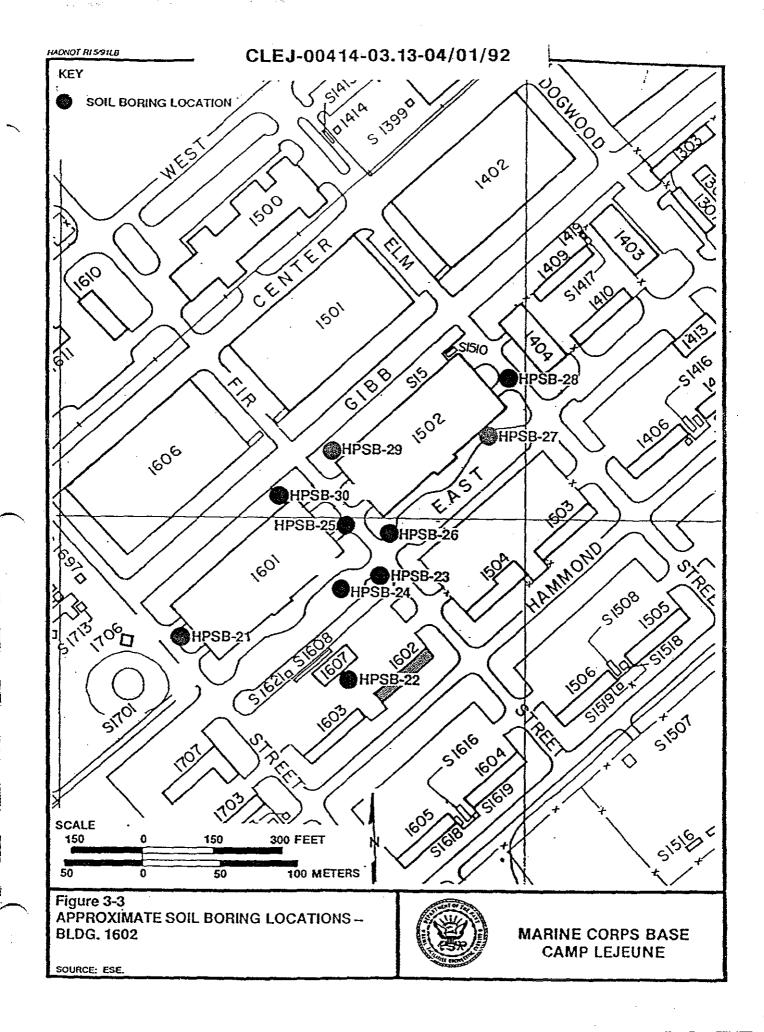


Table 5-3. Soil Sample Analytical Hits - Bldg 1602 Area (page 1 of 2)

			\$B-21			S8-22				SB-23			SB-24				SB-25	
COMPOUND	d#••	HPSO21-1		2 HPSO21-3 4-6'	HPSO22-1	HPSO22-10 (HPSOD-7) 0-2'	HPS022-2 2-4'	HPSO22-3	HPSO23-1	HPSO23-2 2-4'	HPSO23-3	HPSO241	HPSO24-10 (HPSOD-9) 0-2'	HPSO24-2 4-6'	HPS024-3	HP\$O25-1	HPSO25-2	HPSO25
	depth:	0-5.	2-4'		0-2'										6-8*			
Chloromethane		110	110	13U	110	3J	110	130	110	120	110	110	110	110	110	110	110	110
Bromomethane		110	110	t3U	110	11U	110	13U	110	12U	t1U	110	11U	110	110	11U	(10	110
finyl Chloride		110	11U	13U	11U	110	110	13U	110	120	110	110	11U	110	110	110	11U	110
chìoroethane		11U	110	13U	11U	110	HU	13U	110	120	11U	11U	11 U	11 U	110	11Մ	110	110
Methylene Chloride		2BJ	2BJ	28J	ぜし	eu	െ	eu	28J	6U	5 U	48J	13	вU	8U	5U	5U	eu.
\cetone		5BJ	387	178	25	11J	26	-31	110	12U	ผ	20	38B	14	40	103	12	ಟ
arbon Disultide		eu .	8U	6U	eu	eU	ស	eU	6U	t98	5U	5U	5U	6U	60	5U	5U	eυ
,1-Dichloroethene		បទ	6U	U9	ଧେ	eU	eu	eU	6U	eU	5U	5U	5U	вU	θU	5U	5∪	8Ų.
,1-Oichforoethane	•	6U	au.	eU	đŲ	eu	6U	вU	6U	вU	5U	5U	5U	6Ú	6Ú	5U	5U	6 U
,2-Dichloroethana (ti	otai)	ಟ	6 U	8U	8U	€U	8U	6U	6U	6U	5U	5U	5U	6U	6U	5U	5U	e∪'.
Thloroform		6U	8U.	¢U	eu	eU	6U	6Ų	6U	6U	ಕಟ	5U	5U	вU	6U	SU	5U	6 U
,2-Dichloroethane		6U	6U	e∪	6U	бÜ	€U	6U	6U	80	5U	5U	SU	6U	6U	sU	S U	θU
-Butanone		110	110	13U	110	11U	110	130	110	12U	11U	11U	អប	11U	110	110	t1U	110
1,1-Trichloroethane		* 6U	8IJ	6U	6U	6U	вU	aU	6U	6U	5U	5U	5U	6U	6U	5U	5Ú	ยบ
arbon Tetrachioride		eU	6U	6U	8U	6U	6U	8U	6U	6U	50	5U	5U	8U	6Ú	5U	5U	6U
inyl Acetate		110	110	13U	11U	110	110	13U	110	12U	110	110	110	11U	110	110	ttU	110
romodichloromethan		6U	6U	6U	eU	6U	6U	611	6U	6U	5U	5U	5U	BU	8ป	5U	5U	6U
2-Dichloropropane		eU	6U	6U	BU	U3	6U	BU	6U	eu	5U	50	5Ú	6U	6U	5U	50	вU
s-1,3-Dichloroprope	ne	6U	6U	6U	8U	eU	ಕಟ	aU	6U	eU	5U	5U	5U	6U	eu	5U	5U	8U
ichloroethene	•	4Ú	UB	6U	6U	6U	6U	6U	6U	9U	SÜ	5U	5U	8U	8U	4J	5U	6U
bromochloromethar		6U	60	€Ú	8U	ย	8Ú	8U	บล	ett	Ua	5U	5U	6U	6U	5U	5U	6U
1,2-Trichloroethane		8U	6U	Us	UB	aU	EU U3	60	6U	вU	5U	5Ú	BU	6U	6U	5U	5U	eU
nzene		6U	6U	8U	eU	€U	U3	8U	ยา	6U	5U	5U	5U	θÜ	5U	5U	5U	6U
ins-1,3-Dichloroprop		eu	6U	6U	eU .	8U	6U	6U	8Ü.	6U €U	5U	5U	5U	6U	BÜ	5U	5U	6U
rowojawa maritaria	Na ind	eu:	8U	UB	6U	8U	en en	6U	6U	au		5U	5U	6U	-		5U	6U
		11Ü	11U	13U	110	11U	110	130	11Ü		50	110	11U		BU	5U	11U	11U
Methyl-2-Pentanone	,			-						12U	110			110	110	110		
Hexanone		110	11U	13U	110	110	110 .	13U	110	12U	110	110	2J	110	11U	t IU	110	110
etrachioroethene		6U	6U	6U	6U	6U	6U	6U	6U	6U	5U	BU	5U	8U	6U	5U	5Ų	8U
1,2,2-Tetrachloroeth	800	6U	Ua	eU	6U	6U	8U	6U	6U	6U	5U	5U	5U	6U	U	5U	5U	8U
oluene		8U	8U	eU	AU	BU	8U	6U	6U	eU	5U	5U	5U	8U	8U	SU	5U	8U
hlorobenzene		6U	6Ų	8U	eU	6U	6U	đŲ	6U	6U	5U	SU	5U	6U	6U	5U	5U	6U
hylbenzena		eu.	6U	6U	eu	€U	6U	6U	eu	eu	5U	50	5U	Ua	6U	5U	5U	6U
yrena		eu	6U	€U	90	6U	eU	ಕ೮	6U	6U	5Ų	50	5U	€U	eu	5U	5U	6U
tal Xylenes		- 6U	6U	8U	en ,	€U	aU	8U	EU	6 U	SU	5U	5U	പ	€U	50	SU	6U
phthalene		370U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NΑ	NA
nethylnaphthalene		3700	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
benzofuran		270U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ensithmene		370U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
eldán		18U	18U	20U	18U	18U	18U	21U	92	18U	170	17U	17U	18U	18U	170	17U	18U
4'-ODE		18U	18U	20U	180	18U	18U	210	78	180	17U	17U	17U	18U	Ust Ust	170	17U	taU
4'-DOT		18U	180	20U	180	18U	taU	210		185	110	1.0	110	.00	140	170	17U	160

Note; All concentrations ug/kg
Volatile, semivolatile and posticide compounds only
NA = Not Analyzed
U == Not detected (Detection limit)
J == Unquantitable identified compound
B == Detected also in associated blank

Source: ESE, 1892

Table 5-3. Soil Sample Analytical Hits - Bldg 1602 Area (page 2 of 2)

			88-26				SB-27			SB-28	•		SB-29			SB-30	
		HPSO26-1	HPSO26-10	HPSO26-2	HPSO26-3	HPSO27-1	HPS027-2	HPS027-3	HP\$028-1	HPS028-2	HPSO28-3	HPS029-1	RPS029-2	HPS029-3	HPS030-1	HPSO30-2	HPSO30-3
СОМРОИМО	depth:	0.2	· 0-2'	6-8'	8-10*	2-4'	4-6'	8-10	0-2'	2-4'	8-10'	0-2'	2-4'	10-12'	0-2*	2-4'	10-12
Chloromethane		110	110	110	110	110	110	12U	110	110	120	110	110	110	110	110	12U
Bromomethane		110	110	11U	110,	110	110	12U	110	110	12U	11Ú	110	110	1 1U	11U	12U
Vinyt Chlorida		110	110	110	110	110	11U	12U	110	110	12U	110	11U	11U	11U	110	120
Chloroethane		110	110	11U	114	11U	110	12U	110	11 U	120	110	110	110	11U	11U	12U
Mathylene Chloride		181	4BJ	4BJ	5BJ	4BJ	158	5 8 J	5U	8U	6U	145	2BJ	88	28J	2BJ	1BJ
Acetona		6J	11	98 J	19	110	308	50B	97	3BJ	8BJ	6BJ	78J	68J	6BJ	7BJ	7BJ
Carbon Disulfida		5U	5U	6U	ьU	50	5U	8U	5U	6U	eu	5년	5U	5U	6U	6∪	6U
1,1-Dichloroethene		5U	5U	eu us	eU	5U	5U	eU	5U	вÚ	eU	5U	BU	50	eU	േ	6U
1,1-Cichioroethane		5U	50	eu	ಕರ	5U	5U	eU	5U	eu	вŲ	5U	5U	5U	Ua	ബ	вU
1,2-Dichloroethene (otal)	ಕಲ	ಕರ	6U	gU	ธน	SU	6U	5 U	ಕರ	eU	5U	5U	5U	eu	ಕರ	6∪
Chloreform		5U	5U,	6U	ಕರ	5U	5U	6U	BU UB	вU	6Ü	6U	5U	5U	ąU	eu	6U
1,2-Dichloroethane		5U	50	€U	εU	5U	5U	6U	5U	6U	e∪	5U	5U ,	SU	6U	6U	6U
2-Bulanone		110	110	tiU	110	110	110	12U	110	11U	12U	110	110	110	11U	110	120
1,1,1-Trichloroethane		5U	5U	eU	eU	5 U	۵U	6U	5U	eU	6U	5U	5t/	5U	8U	eu	6U
Carbon Tetrachloride		5Ü	5U	aU.	6U	5U	SU	6U	5U	aU	au Ua	5U	50	5U	вU	6U	60
Vinyl Acetale		11U	110	110	110	11U	11U	12U	110	110	12U	110	110	110	11U	110	120
Bromodichiorometha	18	5U	5U	6 U	6U	5U	5U	6U	5U	εU	6U	5U	5U	5U	aU	8U	6U
1,2-Dichloropropane		5U	5U	6U	6Ú	5U	5U	6U	5U	8U	6U	5U	5U	5U	aU	8U	6U
cls-1,3-Okhloroprope	ne	5U	5U	6Ú	8U	5U	5U	EU.	su	6U	eU	50	5U	5U	eu.	6U	6U
Trichloroethene		2J	2J	eu	611	SU	ธน	eu.	5U	eU	6U	5U	5U	5U	eu.	6U	6U
Dibromochlorometha	10	5U	5U	au	6U	SU	SU	6U	5U	θÜ	eU	50	5U	5U	ėU.	6U	8U
1,1,2-Trichloroethane		5U	5U	eu	60	SU	5U	6U	5U	ยับ	6U	5U	5U	5U	aU	eU:	8U
Benzene		5Ú	5U	6U	6U	รบ	5U	6U	5U	6U	eu	5U	5U	50	eU	5U	6U
rans-1,3-Dichloropro	nene	5U	5U	6U	6U	5U	SU	6U	5U	6U	6U	50	5U	5U	eu .	6U	6U
Bromotorm		5U	5U	eu	6U	5U	5U	eu	5U	80	eU	5U	5U	5U	6U	Ua Ua	6U
4-Methyl-2-Pentanon	•	110	110	114	110	2J	11U	12U	1111	11U	120	11U	110	110	11U	110	120
2-Hexanone		tIU	110	114	110	110	110	12U	110	110	12U	110	110	110	110	110	120
etrachloroethene		· 5U	5U	6U	BU	5U	5U	81.1	5U	611	8U	5U	5U	5U	eU	60	6U
1,1,2,2-Tetrachloroett	1878	5U	5U	6U	บอ	5U	5U	6U	5U	6U	6U	5U	5U	5U	US US	6Ú	Ua Ua
foluene	14114	5U	5U	6U	EU UB	5U	5U	6U	5U	6U	6U	5U					
Chiorobenzena		5U	5U	au	6U	5U [.]	5U				_		5U	5U	đÚ	6U	6U
								6U	5U	6Ú	6U	5U	5U	5U	6U	6U	6U
thy/benzene		5U 5U	5U. 5U	8U	eu eu	50	5U	6U	5U	6U	8U	5U	5U	5U	eU	8U	Ua
Styrene		5U 5U	5U	6 U	8U	5U	50	6U	5U	eU	eU	5U	50	5U	6U	EU.	6U
otal Xylenes				6 U	5U	5U	5 <u>U</u>	6Ų	5U	UB	au	5U	5U	5U	₿Ų	8U	8U
laphthalene		NA ***	NA	NA NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5501	NA	NA
-Mathylnaphthalene		NA ***	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3001	NA	NA
Dibenzofuran		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	51J	NA	NA
henanthrene		NA	NA	NA	NA	NA .	NA	ŅA	NA	NA	NA	NA	NA	NA	110/	NA	NA
leidrin		17U	170	180	180	17U	17U	19U	17U	18U	18U	16U	180	18U	18U	18U	190
.4'-DDE		170	17U	18U	18U	170	17U	19U	170	18U	19U	18U	18U	18U	160	18U	19U
,4'-OOT		17U	17U	16U	18Ų	17U	170	19U	17U	18U	19U	180	180	16U	18U	180	19U

Note: All concentrations ug/kg
Volatile, semivolatile and pesticide compounds only
NA = Not Analyzed

U = Not detected (Detection limit)
J = Unquantifiable Identified compound
B = Detected also in associated blank

Source: ESE, 1992

THE LEVELLE - HPTA WOLATCLE DRIVING COMPOUNDS IN SOIL SAMPLES Concentration in Ug/kg

CHART = SCIL -VII

			SE-21	,*			SI-22	
		4FS021-1	FP\$021-2	IPS021-3	HPS022-1	4F\$022-10 (FP\$00-7)	IPS022-2	rPS022-3
OHPOUND	ceptha	0~21	2-47	4-61	0.21	0-5.	5-61	4-6"
hloromethane	*** 464 524 5	i'ij	110	130	114	Z:	114	13u
ronpastasna		170	11U	.30	11u	ราบ ราย	119	13u
inyl Ciloride		179	110	139	110	ערר ערר	110	130
l larcethene		110	110	.37	tiu	119	'1 9	13u
ethylere Chloride		21.	581 1.0	121	લા	ජ් <u></u> ව	ಕು	60
cetine		231	181	:73	చ క	เน้า	24 24	31
erbon Disulfide		Ð.	รม	చ	γi ⊃	න	మ	şu ,
,1-Dichloroethere		. 60	SU	ಕು	ŖI ∽	81	చు మ	£U.
.1.Dichloroethane		en ~-	ક્ય	6)	យ	e.	 دا	£U £U
,2-Dichlerosthene (total)		₩	en en	ون م	ķη Ω	eu eu	ಕು	£U £U
trotatom protatom		RTI CM	50 60	át:	EU EU	en en	éJ	셆
.2-Dichlerosthens		en T	କ ~	&	ដ	er Er	ىن لۇ	su šii
- Patrico ce con este - Patrico ce con este		11y	113	134	110	14U	175 175	50 130
,1,1-"clak tarpethane		SU.	6J	6U	- इंग ' । त	9N	60	su su
rrban Tetrachtoride		en ~:	మ	8G	en en	쇖	eu.	SU SU
Snyl Acetyte		utr	15.	130	110	114	1:0	134
rosociatiloromethane		60	۵.	en '22	ซูบ - เบ	en Lin	EU.	&U
2-Dishloropropens		£U	e.	6U	en 10	យ	쇖	8.
Firl_3-Dichloroprocens		धा	6.°	90 ~~	40 40	en ~~	en en	s.
richtsroethene		£U	64	en en	&	en T	£U	ec ec
[bronoch] pronethane		ŝU	5u	KU .	94	<u>เน</u>	en -~	6L
1,2-Trichi.orsethane		έU	ěL.	۳۱ 	6U	en ~	W.	a.
rtene		SU SU	₹ñ ~~	ะ 	en 24	SU SU	6U	971 27
uns-1,3-Dichloropropane		śu	쇖	eu	en m	50 50	ผ	PN PN
Ang the property of the		కు కు	£U	6U	80	5u 6J	ह्य इंग	RI Pri
Hetipi-2-Fentanone		210	11U	130	110	11.	11u	130
fexarene		VIV	110	12 <i>u</i>	110	130		
strachlorsethere		ري. دي	έU	120 EU	60 110	137 132	510 01	130
1,2,2-Tetrachtoroethare		জ- \$য়	SU SU	र्थ। र	en en		eu o	धा
ignete Trafe, tert matthemattiche		a.	6U	දැ දැ		6U	θU O	KU .
i Londenzere		a.	eu EU	සා ජා	5U	άU //·	6 U	لئ
hyr, bersene		a.	eu éu	ණ භ	60	60	en en	لک د
npromiene Viene		o. 8.	€U ⊕U	er.	50	éu éu	60	6.1
r Li ette		60. 60.	¢n	5 4	£U	en:	en	6.7

CAPP LEVEUSE - PPIA VOLATTLE DEGRATO CONFOUNDS IN SOLL SAPPLES Concentration in ug/kg

CMRT = 800L-912

Rotal Xydenes

1		. •	\$3-23				\$8- 2 4	
•		is2053-1	FP9023-2	478023-3	HPS024-1	HP\$024-10	#\$034-2	1PS024-3
CONFOUND CONTROL	c'eptri:	0-51	2-41	4-61	0-21	0-5-	2-61	6-B1
historethase	44 44- 1 44- 1	112	12U	11.	110	1lu	1:4	'1IJ
LOLIONE CHOUS		110	120	175	110	114	170	. 1ก
ingi Chiloride		190	120	17.	110	114	180	1J
higroetians		11:	120	120	110	110	110	113
edhylere Chlorice		25.	6U	5. 5.	£81	1,1	60	5J
cetone		12.	120	21	50	368	14	4]
erbon Disulfida		a.	ęn Fi	9.	žn Ž	Su Su	6U	- <u>،</u> دا
_1.0 ichlorogthere		о. 8.	SU SU	5u	112 112	50	쇖	6J
_1.Dichlorosthare		a.	SU SU	71 Si	Su .	SU	en en	به
,2 Dichlerosthens (total)		6U	ହ ଅ	Si	5U	SU	άÜ	e) C
hioroforn		e:	en en	SU SU	5U	50	80	رد
"2-Dichleroethane		6U	٩٤٦	Su	ŝu	5U	en en	eu
-Eutenare		110	123	110	i iti	110	110	1'0
,1,1-1-lichioroethene		60	හ	Su Su	Συ	5U	60	₩.
erbon Tetrachtorice		ᇷ	6.3	5U	9.	3U	£U £U	en Gi
inyi Apatate		110	127	110	Jin.	11µ	110	1:0
rosocichi oronethane		en 	eu eu	3U	5.	รม	SU	80
.a-Dichleropropare		έÜ	a.	SU SU	<u>s</u> .	รับ	SU	w.
is-1,3-Dichleroprepens		ěII	AU	Su	Si Si	53	6.°	ผ
richloroathere		en 	4U	5U	5ú	5.3	<u>د.</u>	6U
pronochlaronethane		ĶI)	8U	Su	30 50	5u	ص ش	똆
1,2-frictionsethere		ęn M	<u>ئ</u>	5U	5) 5)	5u	6	8U
i i veri i veri di ce di lese.		en en	%I ~~	5 <i>U</i>	مد قا	.~ 51	٥ <u>.</u>	£Ü
rans-1,3-Bichiteropropene		ક્યા 	9f) 	Su	5ú	SU SU	Q1	£0 £0
romoform		6U	en En	\$v	SU SU	5U	āu	au au
Rethyt-2-Fentanore		! 1:វ	120	112	110	110	1 l tr	170
·lexanone		. 1u	120	.15	110	ະນ	110	110
itreatforcethine		61	લા	9.	5 U	EU EU	ΔÚ.	en N
1,2,2-Tetrachioncethane		6 Ú	£0 ~	5.	5U	5U	刨	97
iluene		<u>ون</u>	6U	51	50	รับ	AU AU	97
lorobentene		6J	<u>දැ</u>	5: .	5 <u>u</u>	赵	మ మ	6U
thylbenzere		4 <u>3</u>	60	∽ 9.	50	541	50 50	90 00
yrene		6J	દ્ય	51	5.J	n. L	50 60	en en
) Ele monte			AD.	_		*	QQ ¹	ĐΨ

£U

SU.

5.1

80

6J

COMP LEUSINE - APIA VOLATELE ORGANIC COMPOUNDS IN SOIL SAMPLES Concentration in Legica

CHART = SCIL-VII

			\$5.25			\$1-26				
		IP9025-1	\$-5503¢#	EP9025-3	IPS025-1	IPS026-10 (HPS00-8)	S-52034H	HPSOZS-3		
COMPOUND	cepti:	2-21	2-41	6-81	3-21	3-5,	6-31	8-101		
thloropethase		110	1%	110	11 0		110	1:4		
snonorethane		า1ย	110	טור	114	110	110	110		
iiry. Caloside		114	l 1ta	טור	ຳ13	113	110	110		
hloroethere		118	190	11 0	ารม	118	11U	1ងរ		
ethylere Chioride		<u> 50</u>	5 0	& U	34	ER.	481	581		
petone		100	12	24	SI	11	981	19		
erbon Disulaide		5U	5u	ಕಚ	SJ.	د ۶	£U	άU		
,1-9ichlorsethere		511	51	6.1	የታ	ร์ม	£U.	$\mathbf{e}\hat{\mathbf{n}}$		
1-01chlorosthane		ទីប	5 U	డు	3J	5,3	£U	M I		
2.0ichlorgethere (total)		SJ	51	ن8	9,5	5 7	£U.	6U		
lerofera		5.4	5 U	e)	16	9J	śU	ėų:		
,2:Dichlorosthede		5.	5 11	8ा	91	91	શ્રા	άU		
-Butenone		(1)	110	17c	110	11g	110	1 1U		
1,"-Telchieroethane		9.	\$U	8u	51	5 1	ક્ય	6Ü		
irbon Tesraek loride		s.	5U	6U	51	Su:	SU .	ьu		
inyl Acetate		fil	114	110	1!0	114	. 10	110		
romodichionomethene		5.	\$U	8J	۶ú	5U	ಕಚ	60		
2-Dischlipropropane		9.	ទួរប	60	50	5 U	63	幺		
s-1,3-Dichleropropere		5	50	90	\$U	511	&J	śυ		
ichlorathere		4.1	50	យ	2.1	2.1	ðu.	50		
bronochloronethine		匁.	SU	ΔÚ	ឡ	Sú	6.	SU		
,1,2-1nishlarbethene		ЯJ	SU	tu	Su	SU	80	6.1		
Higene		Su	SU	60	5 ti	50	ěL.	5.5		
ens-1,3-0 ichi propropene		\$u	511	60	Su	SU	au .	ð.		
rougform		5U	5U	άU	50	5 u	क्षा	8 2		
-Pethyl -2-Pertanone		110	112	110	110	510	tiu	110		
-Rexanone		110	110	110	110	עיו	118	110		
itrach lorbethene		5u	5.	SU	50	Str	£U.	<i>8</i> 0		
1,2,2-Tetrachiorpethane		50	5.,*	5U	Su	Sr	£Ш	60		
tuare		\$U	5.	ક્ય	5.1	Su	6U	₹ri ~		
Lonzbenzene		SU	5.	ຍປ	521	5U	EU	쇖		
thy/ibenzene		5µ	5.	&U	5 u	50	80	6U		
· Tyrens		5u .	5.	S)	9.1	50	64.1	έU		
ote. Xyleras		5U	SI	<u>د.</u>	50	5U	δü	60 50		

QUMP LESSUME - HPCA VEHABLE ORGANIC COMPOUNDS IN SOIL SAMPLES Concentration in Us/Mg

C4437 = SQIL-VIA

Total Dylanes

			35-27			SB-25		
		и≉5027∙1	HP\$()27-2	#F5027-3	H25023-1	1P\$C26-2	HPS028-3	
COMPOSINO	deptha	5-61	L-er	8-10°	0-21	2-&r	8-10/	
.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	*** *** * ***	••••••••••••••••••••••••••••••••••••••	116	72U	* 1U	110	12u	1 1
it joromethane		1,2	114	72U	1.0	718	120	
Iroronethane		ני:	11L	120	 : •u	110	120	
linyl Chloride		-	110	, 5n	1'4	· 1U	120	
in,orsethane		1'J	158	ie.	9.i	4U	崩	
deshylene Chionice		43 <i>2</i> 110	308	516	77	30 38J	981 90	
icetore		5 <u>.</u>		5.5 5.7	5u	6U	ស. ស	
Carbon Disulfide			50 50		رو و	6U	ěU Liá	
,1-Dichlorosthere		50 20	5 U	SU 1			हत en	
l, 1-0 chloroethare		50 	50	<u>ል</u> ፣	5u ***	क्ष		· · · · ×.
,2-Dichicroethere (total)		51	5u	e.	50 20	6J	64	
th Loro form		5u	5U	a.	5u 	60 00	<u>ڊ</u> ر	1 30/ 13/ 1
(,2-Cick(aroatkenă		50	5U	&.	50	6tr	لة	1 4 70 191 1
enonatuă:		114	11u	13.	110	1.6	,50	1 3 4 5 5 1
l,',1:TrichSarcethane		50	វ ប	60	50	90	ಟ	
≥roon fetrachlori≤e		50	211	8C	50	40	હા	1242 PM
ilny: Acetste		110	, រក	12:	110	11u	ليدا	
inomodi shikinopethare		5U	2J	ěU	5 N	80	해	
,2-Diestoropropase		5U	5:1	80	50	स्प	67	1 9 24 2 27
is-1,3-Jicklaropropens		5U	5J	δU	5 U	ŖÜ	9U '	
ri :r larpethene		5 U	3.1	60	50	ЬU	ស	
lbromos*laromethere		ទ្ ប	27	άU	ទ ប	80	ĸu	A 1
I,I,Z-Trichloroethare		SU	92	60	50	£U	ક્ષા [
enzena		20	9 ./	ŔU	5 J	£U.	eu ¦	
rans-1,3-01chloropropere		SU	51	641	5.	δU	eu l	HEC AND
iransiata		5 U	9 <i>7</i>	60	9. :	& U	SÚ.	PROJECT PREPARED DATE CHECKED B
i-Hathyl-ZiPentanona		21	114	150	1 : Lu	170	12U	- 発悟 - 別日:
-Haranone		l ful	110	าสม	1141	1 D.	ะเม	• द ४
etrachlargathere		Su	Su	80	Su	ø.	ક્ય :	-
I_1,2,2-retrachlorosthare		90	Su Su	رة	 الا	ėu	9.	*
olute		รับ	5u	<u>ئ</u> ي دا	 تا	ķij 	Ġ.	
tionobenzene		5U	સ્યુ	&) &)	· 5u	en en	90) ~~	
shylbenzene		ر ر دو	5U	97	Su	šij	611	
istrystomiceres Ityriane		51 51	50 50	81 91	su Su	su su	śü	

5u

5U

CAMP LEIBURG + (PIA VOLATIVE ORSANIC OCHPOLICS IN SOIL SAFPLES Concentration in USANE

CP447" = \$011-9"5

			58-29			5B-3I	
		#FSC29-1	H>5029-2	HP5029-3	HP5030-1	47S030-2	FP\$030-1
compositio	depth:	2-21	2- £ + '	10-121	ስ •5•	3-¢1	10-121
Ditorometrane		! 1y	1lų	110	110	ענו	120
Promoneth ene		71U	1:0	114	110	:1J	120
inyl Chloride		i fili	180	11u	110	113	120
hlorsethane		119	†:u	110	114	114	120
ethylene Chlarice		146	232	80	381	21.	161
detone		€£√1	73.	931	\$ 6 1	7E.	79.1
arbon lisgifide		5.1	50	50	£U.	لة	ш
, '-bich largethere		9.:	50	50	en en	83	en
, -Dictionoethers		50	5u	50	£U.	دی	έU
,2-11ch:oroethene (fotal)		5. .	5 u	5 U	60	a.	έÜ
hloroforn		5J.	5u	50	KU .	رة	w
2-3 lch.orcethane		9.	Su	5 U	£U	Ð.	6U
Butierona		170	114	110	114	182	1211
!, 1-Trichlorpethane		51.	5U	5u	£U	16	έU
rbon Tetrechtorice		9:	\$u	5u	ដ	80	ω
myl Acetate		11L	110	71 IJ	110	114	120
onedickleromethace		श्र	Su	5U	£U	80	હ્ય
2-1ich.orepresens		54	\$U	5 U	£Ü	δü	હ યુ
s-1,3-Dichloropropers		5u	5U	50	કંઇ	6U	eu ·
rick largethens		54.	50	5 u	ફંઇ	en en	కర
branock icrosethene		5 0	5 1 1	5บ	હ્ય	क्षा	a.
1,2-Trichlorsethine		54.	\$U	SU	ŧυ	60	8 U
and the		54	ŞU	5 U	ક્ય	60	8.
ans-1,3-Dichlaropropere		5 J	50	ริน	લ્ય	60	8:
moleso		5U	Su	ร์ข	60	UA.	ol:
Mathyl-2-Pentanone		110	ur!	l that	I R.	TU	120
Hexanone		1111	' 1u	ITP .	17.	; 1 <u>U</u>	121
trachloroathene		5U	รีย	5.	8 .	óu.	60
1, 2,2-Tetrachlo-sethane		50	5U	5.	ð.	41	60
luene		50:	5ข	5.	6.i	Y)	SU
Igrobenzane		5U	รับ	5.		쇖	50 50
hylbergens		5Ú	5.J	5.	&. &.	eri evi	5U
3ffete		รีม	9ú	회	%I ~	લા	ري وي
tal Kylenes		28 28	5./	50:	ųπ ~	80	ری

CAMP LEIEUME - EPIA SEMI-YOLATTLE ORDANIO COMPONIOS IS SCIL SAMPLES Concentration in Ug/Ag

CH447 = SOIL-SS.

2,6-0 initrotoiuere

		\$3-2"	\$3-30	
•		MFS021·	125032-1	
OMPOLIO	depth:	0-51	0-2-	
Phenal		370u	370u	
bis(2-Chicroathyl)ether		3700	3700	
2-ghtarophenal		370u	3750	
,3-01chlerobensene		370u	3700	
,4-Picklarobenzere		370u	370u	•
ienzyl Alochol		3700	3773	· L
1,2-11c1.orsberžene		3710	37:1 :	
E-Meshylphenol		3700	3714	PROJECT LAMO Fellunc.
bis(2-Chrosolssoropyl)ether		3710	3733	I promoner ou NIME Wall all I do
-Hethylphero:		ניגיז	37033	PREPARED BY THE YOUR
-Ni troso-di-n-propylamint		3720	<u> </u>	DATE MALLY 99/
exactlyroethere		3720	374.)	Division of the second
litroberzene		37/JU	37033	CHECKED BY 2 / Knowled
sophorone		3700	370u	~/\'\\\
-Witrophenel		373J	3702	CATE
l_4-DimethyLphero(31ôn	370u	, , –
olat area		15002	12000	The state of the s
Ss(2-thloroethoxy)rethans		3.70U	370U	
(,4-Dichloropters)		\$770LF	3700	
,2,4-1rl chicrobentene		3.70U	3700	
ishtha lene		570U	22DJ	
arlifecorda		370U	370u	
eachiorsbutadie	ne	370u	3700	
Chloro-3-sethylp	oheno:	370U	3700	
ಗೇವಿಗ್ಗಳು⊪ನಗೆಗಿತ್ತು.er	' E-	3700	3021	
exachloracyclopernadiena		370u	37140	
,4,6-frietjarophenoi		37tu	3720	
,4,5-Frichtorephanol		1310	18002	·
Chilatenaphthaller	HE.	37CD	3700	
-Microsoftine		18310	1800.	
Inethylphtralate		3700	370u	•
enspiritry lene		370U	370u	
		- to		

3700

310.5

APPENDIX F.12 BUILDINGS HP1409 AND HP1512 MONITORING WELLS IR78-GW10 AND IR78-GW11 INFORMATION (ESE, APRIL 1992)

No target analytes were detected in the Set Three data. This may be attributed to changes in groundwater levels as summer (i.e., dry season) conditions became prevalent at the site.

No volatile contamination was detected during the Supplemental investigation in any of these wells. Acctone, a laboratory contaminant was also detected as a UIC in wells HPGW5 and HPGW6. No semi-volatile contaminants, pesticides or PCB compounds were detected in any of the wells. Metals (Iron, manganese, and softium) were detected in all three wells above NC primary or secondary drinking water standards. Additionally chromium and idad were detected in two wells (HPGW6 and HPGW7) above the standards.

Buildings 1502, 1601, and 1602

During the soil gas investigation, very high levels of TCE were detected between Bldgs. 1502 and 1601, with lower levels detected between Bldgs. 1601 and 1602. As a result, four shallow monitor wells were installed (HPGW8 through 11) to characterize the groundwater quality. These wells were sampled three times in 1987 during the Characterization Investigation (analyzed for VOCs, lead and oil and grease) and in 1991 during the Supplemental Characterization (analyzed for full TCL parameters).

Well HPGW9-1, located at the center of the soil gas high, was found to contain high levels of O&G (32,000 ug/L), 1,2-DCE (740 ug/L), ethylbenzene (1,100 ug/L), TCE (5,900 ug/L), and xylene (4,500 ug/L) in the Set One data. This suite of detected contaminants is consistent with the usage of this area as a vehicle maintenance facility. The remaining wells in this area were found to contain a similar scite of contaminants, although at lesser concentrations and with a somewhat sporadic distribution. In addition, levels of other volatile compounds such as chloroform, chloromethane, methylene chloride, and tricklorofiooromethane were detected on a sporadic basis in the other wells in this area.

The Set One data indicated a sporadic distribution of VOCs in this area. This pattern was verified by the Set Two data, with some variations. Well HPGW9-1, in the center of the soil gas het spet, continued to be the most highly contaminated, with elevated levels of lead (92 ug/L), O&G (11,000 ug/L), and TCE (6,100 ug/L). Other VOCs detected in Set One may have been present in Set Two, but were obscured by the strength of the TCE peak. The level of trichlerofluoromethane at well HPGW8 had increased with time (14 ug/L to 96 ug/L).

The Set One and Set Two data had indicated a sporadic distribution of VOCs in this area. With the Set Three data, a pattern was delineated. Well HPGW9-1, in the center of the soil gas hot spot, was consistently the most highly contaminated, with elevated levels of lead (70 ug/L), O&G (6,000 ug/L), and VOCs. The specific VOCs present in each data set from this well varies, with T12DCE (2,700 ug/L) and xylene (4,000 ug/L) present in the Set Three data. Other VOCs detected in previous data sets may be present in Set Three, but were obscured by the strength of the T12DCE and xylene peaks. Of significance in the Set Three data was the lack of high-level contamination by TCE which was noted in the previous sets. The second most highly contaminated well was HPGW11. This well was the only one in Set Three to contain detectable quantifies of TCE (24 ug/L). No target analytes were detected in HPGW8 and HPGW10 in Set Three; these wells had previously contained sporadic low-level contamination by VOCs and O&G.

Volatile contamination detected during the Supplemental investigation occurred primarily at well HPGW9-1. Contaminants included carbon disulfide (13 ug/L), 1,2-DCE (1,200 ug/L), obloroform (15 ug/L), TCE (14,000 ug/L), toluene (as a UIC at 330 ug/L), ethylbenzene (700 ug/L) and xytene (3,300 ug/L). Carbon disulfide was also detected at well HPGW-11 (11 ug/L) and TCE as a UIC (2 ug/L) at well HPGW8). Semi-volatile contaminants (naphthalene i90 ug/L and hexachlorocyclopentadiene 49 ug/L) were detected in the same well. Metals (chromium, Iron, lead, and sodium) were detected in all four wells above NC primary or secondary drinking water standards. Additionally, manganese was detected in

wells HPGW10 and HPGW11 above the standards. No pesticides or PCB compounds were detected.

Building 1202

The soil gas investigation identified the presence of high levels of TCE in the vicinity of Bldg. Four wells were installed near this site (HPGW15, HPGW16, HPGW17-1, and HPGW18) to determine the extent of the groundwater contamination associated with the contamination in the soils. These wells were sampled three times in 1987 during the Characterization Investigation (analyzed for VOCs, lead and oil and grease) and in 1991 during the Supplemental Characterization (analyzed for full TCL parameters) Well HPGW 18 could not be located during the Supplemental investigation and may have been destroyed.

One target analyte (O&G) was detected in only one well (HPGW16) in the Set One data. No VOCs were detected in wells HPGW15 through HPGW18 in the Set Two data. O&G and lead were the only two target analytes detected in the samples.

The Set Three data detected trichlorofluoromethane in Well HPGW15. O&G and lead were not detected in Set Three; both analytes had been detected in Set One and Set Two. Although lead was not detected in the Set Three data, the MDL was greater than the concentrations detected in previous samples, but less than the MCL.

Only slight volatile contamination was detected during the Supplemental investigation at well HPGW15. Contaminants included 1,2-DCE (7 ug/L) and TCE as a UIC (4 ug/L) No semi-volatile contaminants were detected in any of wells. Metals (Iron and sodium) were detected in all three wells above NC primary or secondary drinking water standards. Additionally chromium, lead and manganese were detected in HPGW16 above the standards. Dieldrin in well HPGW17-1 (0.11 ug/L) was the only pesticide detected.

APPENDEX 16

SUPPLEMENTAL CHARACTERIZATION INVESTIGATION SHALLOW MONITOR WEELS ANALYTICAL RESULTS

CLEJ-00414-03.13-04/01/92

CAMP LEJEUNE - HPIA VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS) Concentration in ug/l

CHART = HPVOL2

wp8b\hp-vol.wr1 (2)

COMPOUND	нрсив	кр си9-1	HPGW10	HPGW11	HPGW12	(GWDUP2)	HPGW13	HPGW14
Chioromethane	10.0	10.8	10.0	10.u	10,0	10.0	10.U	10.0
Intoromethane Bromomethane	10.0	10.0	10.0	10.0	10.0	10.U	10.U	10.0
/inyl Chloride	10.0	10.U	10.0	10.U	10.4	10.0	10.U	10.0
Chloroethane	10.0	10.0	10.0	10.0	10.U	10.0	10.U	10.0
Methylene Chloride	5.u	5.0	5.0	5.0	5.0	3.BJ	1.J	5.0
cettone	10.0	10.0	10.0	10.0	10.0	10.0	10.U	10.0
Carbon Disulfide	5.U	13.	5.0	11.	5.บ	5.U	5.U	5.0
,1-Dichloroethene	5.U	5.0	5.0	5.0	5.0	5.0	5.0	5.0
,1-Dichloroethane	5.0	5.∪	5.0	5.U	5.0	s.u	5.0	5.0
1,2-Dichloroethene (total)	5.0	1200.	5.0	5.0	5.0	5.U	5.0	5.0
hloroform	5.0	15.	5.0	5.0	5.0	5.0	5.0	5.0
1,2-Dichloroethane	5.U	5.0	5.0	5.u	5.0	5 . U	5.0	5.0
2-Butanone	10.0	10.0	10.0	10.U	10.0	4.3	10.U	10.0
,1,1-Trichloroethane	5.0	5.0	5.0	5.0	5.U	5.U	5.0	5.0
Carbon Tetrachloride	5.0	5,0	5.0	5.U	5.0	5.0	5.0	5.0
/inyl Acetate	10.0	10.0	10.U	10.0	10.0	10.U	10.0	10.0
romodichloromethane	5.0	5.0	5.U	5.0	5.U	5.U	5.U	5.0
,2-Dichloropropane	5.0	5.U	5.U	5.0	5.0	5.U	5.0	5.U
is-1,3-Dichloropropene	5.0	5 . U	5.U	5.0	5.0	5.U	5.U	5.U
richloroethene	2.J	14000.	5 . U	5.0	5.U	5.0	5.U	5.U
ibromoch (oromethane	5.ti	5.0	5.0	5.U	5.4	5.U	5.U	5.0
,1,2-Trichloroethane	5 . u	5.U	5.u	5.0	5.U	5.U	5.0	5.U
lenzene	5.0	5.0	5.4	5.0	5.0	5. U	5.0	5.0
rans-1,3-Dichloropropene	5.0	5.U	5.0	5.0	5.0	5.0	5.0	5.0
romoform	5.U	5.0	5.0	5.0	5.0	5.U	5.U	5.U
-Methyl-2-Pentanone	10.0	10.U	10.U	10.0	10.0	10.0	10.U	10.0
-Hexanone	10.0	10.U	10.0	10.0	10.0	10.U	10 - U	10.0
'atrachloroethene	5.ນ	s.u	5.U	5.0	5.0	5.0	5,U	5.0
,1,2,2-Tetrachloroethane	5.U	5.0	5.0	5.0	5.0	5.ប	۵.0	5.0
oluene	5.U	330.1	5 . u	5.0	5.U	5.U	,5 . U	5.0
thiorobenzene	5.0	5.0	5.U	5.0	5.0	5.0	5.0	5.0
Ethylbenzene	5.U	700.	5.u	5.U	5.0	5.U	5.U	5.U
Styrene	5.0	5.U	5.U	5.U	5.0	5.0	5.8	5.0
(ylene (total)	5.0	3300.	5.U	5.0	5.U	5.U	5.U	5.0

CAMP LEJEUNE - HPIA SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS) Concentration in ug/l

CHART = HPSV2B

wp8c\hp-sv.wr1 (2-B)

CHART = HPSVZB								*****
СОМРОИКО	HPGW8	HPGW9-1	HPGW10	KPGW11	HPGW12	KPGW12D (GWDUP2)	HPGW13	HPGW14
3-Nitroaniline	50.U	50.U	50.U	50.U	50.0	50.U	50.0	50.U
Acenaphthene	10.0	10.U	10.0	10.ប	10.U	10.U	10.U	10.U
2,4-Dinitrophenol	50.U	50.U	50.U	50.0	50.U	50.U	50.0	50.0
4-Nitrophenol	50.U	50.0	50.U	50,U	50.U	50.U	50.U	50,0
Dibenzofuran	10.0	10.U	10.0	10.U	10.0	10.0	10.0	10 U
2,4-Dinitrotoluene	10.0	10.U	10.0	10.0	10.U	10.0	10.0	100
Diethylphthalate	10.0	10.U	10.U	10.U	10.0	10.0	10.0	100 4
4-Chlorophenyl-phenylether	10.0	10.0	10.0	10.4	١٥,٥	10.U	10.0	10 U 7 20
Fluorene	10.0	10.U	10.0	10.0	10.0	10.U	10.U	10 0 3 22 6
4-Nitroaniline	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50 U . %
4,6-Dinitro-2-methylphenol	50.0	50.U	50.0	50.U	50.U	50 . u	50.U	50 U -
N-Nitrosodiphenylamine	10.0	10.U	10.0	10.U	10.0	10.0	10.0	10 0
4-Bromophenyl-phenylether	10.0	10.U	10.0	10.0	10.ປ	10.44	10.U	10 10
lexach Lorobenzene	10.0	10.U	10.U	10.0	10.U	10.0	10.0	10 th 315-31
Pentachlorophenol	50.U	50.U	50.U	50.U	50.U	50. U	50.U	50 p = 1
henanthrene	10.0	10.U	10.0	10.0	10.U	10.0	10.0	10.4
Anthracene	10.0	10,U	10.0	10.0	10.0	10.U	10.0	10.1 📉 🛣
) f-n-butylphthalate	10.U	10.U	10.0	10.ប	10.U	10.0	10.0	10.4
fluoranthene	10.0	10.0	10.0	10.0	10.0	10.0	10.0	PROJECT PREPARED
Pyrene	10.0	10.ປ	10.0	10.U	10.0	10.0	10.0	10.4 H &
Butylbenzylphthalate	10.0	10.4	10.0	10.0	10.0	10.ບ	10.0	10.4 오 핃
3,3'-Dichlorobenzidine	20.0	20.U	20.0	20.0	20.0	20.0	20.0	
Benzo(a)anthracene	10.0	10.0	10.U	10.0	10.0	10.0	10.U	10.0
Chrysene	10.U	10.U	10.0	10.U	10.U	10.U	10.0	10.U
bis(2-Ethylhexyl)phthalate	2.J	10.U	10.0	10.0	10.U	10.0	10.ប	10.0
Di-n-octylphthalate	10.0	10.0	10.U	10.0	10.0	10.0	10.0	10.0
Benzo(b)fluoranthene	10.0	10.U	10.U	10.0	10.0	10.U	10.0	10.0
Benzo(k)fluoranthene	10.U	10.U	10.0	10 .ບ	10.0	10.0	10.0	10.0
Benzo(a)pyrene	10.U	10.U	10.0	10.0	10.U	10.U	10.0	10.0
Indeno(1,2,3-cd)pyrene	10.U	10.U	10.0	10.0	10.0	10.0	10.0	10.0
Dibenz(a,h)anthracene	10.U	10.U	10.0	10.0	10.0	10.0	10.0	10.0
Benzo(g,h,i)perylene	10.0	10.U	10.U	10.ປ	10.U	10.U	10.U	10.0

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CAMP LEJEUNE - HPIA SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER (SHALLOW WELLS) Concentration in ug/l

CHART = HPSV2A

2,6-Dinitrotoluene

wp8c\hp-sv.wr1 (2-A)

CHART # HPSVZA								
COMPOUND	HPG₩8	HPGW9+1	HPGW10	HPGW11	HPGW12	HPGW120 (GWDUP2)	HPGW13	яр сы 14
Phenol		10.8	10.U	10.U	10.0	10.U	10.U	10.0
bis(2-Chloroethyl)ether	10.0	10.0	10.0	10.0	10.U	10.0	10.U	10.0
2-Chlorophenol	10.U	10.0	10.0	10.U	10.0	10.U	10.U	10.0
1,3-Dichiorobenzene	10.U	10.0	10.0	10.U	10.0	10.0	10.U	10.0
1,4-Dichiorobenzene	10.U	10.0	10.U	10.0	10.U -	10.0	10∪	10.0
Benzyl Alcohol	10.0	10.0	10.0	10.U	10.0	10.0	10.U	الـ 10 ا
1,2-Dichlorobenzene	10.U	10.0	10.U	10.U	10.U	10.0	10.0	10.0
2-Methylphenol	10.U	10.0	10.0	10.U	10.U	10.0	10.U	10.0
bis(2-Chloroisopropyl)ether	10.0	10.0	10.0	10.U	10.0	10.U	10.0	10.0
4-Methylphenol	10.0	10.U	10.0	10.U	10.0	10.U	10.U	10.0 5
N-Nitroso-di-n-propylamine	10.0	10.0	10.0	10.U	10.0	10.U	10.0	10.0
fexachloroethane	10.0	10.0	10.0	10.0	10.U	10.U	10.U	10.0
Vitrobenzene	10.U	10.U	10.0	10.0	10.0	10.U	10.U	10.0
Isophorone	10.U	10.U	10.U	10.U	10.0	10.U	10.0	10.0
2-Nitrophenol	10.U	10.U	10.U	10.U	10.0	10.0	10.0	10.0
2,4-Dimethylphenol	10.U	10.U	10.0	10.0	10.0	10.0	10.0	ح ∫ا0.0
Benzoic acid	50.U	50.U	50.U	50.U	50.U	50.0	50.0	50.U
bis(2+Chloroethoxy)methane	10.0	10.0	10.0	10.0	10.U	10.U	10.0	10.0
2,4-pichtorophenol	10.0	10.U	10.0	10.ប	10.0	10.U	10.0	10.0
1,2,4-Trichlorobenzene	10.0	10.U	10.0	10.0	10.0	10.ປ	10.0	10.0
Naphthal ene	10.0	190.	10.U	10.U	10.ប	10.U	10.0	10.0
4-Chloroaniline	10.U	10.U	10.0	10.0	10.0	10.0	10.U	10.00
Hexachlorobutadiene	10.0	10.U	10.0	10.0	10.0	10.0	10.0	10.0
4-Chioro-3-methylphenol	10.U	10.U	10.U	10.U	10.U	10.0	10.0	10.0
2-Methylnaphthalene	10.0	49.	10.U	10 . U	10.0	10.0	10.4	10.0
Hexachlorocyclopentadiene	10.0	10.U	10.0	10.U	10.0	10.U	10.0	10.0
2,4,6-Trichtorophenol	10.ប	10.0	10 . U	10.0	10.U	10.U	10,0	10.0
2,4,5-Trichtorophenol	50.U	50.U	50.0	50,U	50.U	5Q.U	50.U	50.U
2-Chloronaphthalene	10.0	10.0	10.0	10.U	10.0	10.0	10.0	10.0
2-Nitroeniline	50.U	50.U	50.U	50.U	50.U	50.U	50.U	50.U
Dimethylphthalate	10.U	10.ប	10.0	10.U	10.U	10_U	10.ប	10.0
Acenaph thy lene	10.0	10.0	10.U	10.0	10.0	10.4	10.U	10.0

10.U

10.0

10.0

10.0

10.0

10.U

10.U

10.0

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CAMP LEJEUNE - HPIA INORGANICS IN GROUNDWATER (SHALLOW WELLS)

Concentration in ug/l

CHART = HP1NG2

wp8e\hp-inor.wr1 (2

METAL/COMPOUND	HPGW8	HPG W9-1	HPGW10	HPGW11	KPGW12	HPGW12D (GWDUP2)	KPGW13	HPGW14
Aluminum	91700	59100	348000	95200	24000	2110	13500	109000
Antimony	22.00	17.6B	22.0U	22.00	22.00	22.00	13.30	13.3U
Arsenic	28.4	3.0B	39.9	9.18	1.80	1.80	47.0	45.6
Barium	173B	126B	492	298	91.5B	46.3B	1298	299
Beryllium	2.10	0.79B	5.6	2.10	2.10	2.10	0.598	2.7B
Cadmî um	4.30	4.30	4.30	4.30	4.30	- 4.3U	4.3U	4.3U
Calcium	10600	23500	56200	9730	34100	117000	41008	4340B
Chromium	91.8	66.4	310	140	25.5	5.20	48.9	127
Cobalt	7.98	6.0U	31.48	6,4U	6.48	6.40	9.3B	12.98
Copper	19.5B	27.1	72.2	30.0	5.9B	3.28	17.0B	34.8
Iron	40900	19800	119000	31800	5600	100	33500	87200
Lead	54.1	128	186	45.2	15.7	1.00	9.0	66.5
Magnesium	5780	11000	14900	11200	7700	119в	7700	8770
Manganese	46.5	45.0	255	103	18.3	1.80	30.3	80.0
Mercury	0.13B	0.100	0.82	0.10B	0.100	0.100	0.100	0.26
Nickel	25.28	15.1B	92.2	23.6B	11.00	11.00	21.18	41.6
Potassium	5300	5370	17100	7320	2600B	5280	4520B	6890
Selenium	3.6B	3.68	1.60	3.7B	5.8	1.60	3.4U	3.4U
Silver	6,20	1.60	6,20	6.20	6.20	6.2U	2.18	2.5B
Sodium	8600	20400	3950B	5410	9310	6560	18100	11500
Thallium	1.10	4.4U	1.10	1.10	1.10	1.10	4.40	4.4U
Vanadium	945	75.3	376	166	31.1	6.68	40.5B	163
Zinc	118	115	224	94.0	46.6	44.5	127	206
Cyanide	10.0U	10.00	10.00	10.00	10.00	10.00	10.0U	10.0U

CAMP LEJEUNE - HPIA PESTICIDES IN GROUNDWATER (SHALLOW WELLS) Concentration in ug/l

sy\wp8b\hp-pest.wr1 (2)

CHART = HPPEST2		•	-				sy\wp8b\h	p-pest.wr1 (2)
PESTICIDE/PCB	нрсив	HPGW9-1	HPGW10	HPGW11	HPGW12	HPGW12D (GWOUP2)	HPGW13	HPGW14
alpha-8HC	.05U	.050	.05U	.05u	.05Ų	.05U	.05U	.05U
beta-BHC	.05U	.osu	.05U	.05u	.05U	.05U	.05U	.05U
delta-8HC	.05U	.05U	.05U	.05u	.050	.050	.05U	.050
gemma-BHC (Lindane)	.05U	.050	.050	.05u	.05U	.050	. 05U	.05U
Keptachlor	.05U	.05U	.05U	.05U	ى05،	.050	.05U	.05U
Aldrin .	.05U	.05U	.05u	.050	.050	.05U	.05U	.05U
Heptachlor epoxide	.050	.05U	.050	.050	.050	.05U	.05u	.05U
Endosulfan I.	.0\$U	.050	.0SU	.05U	.05U	.050	.05U	.05ช
Dieldrin ²	.100	. 100	.100	.100	.100	.100	.10u	.10U
44-DDE-	.100	. 100	.100	.100	. 10u	.10u	.10U	.10U
indrin	, 10U	.100	.100	.1 0 U	.10u	.100	. 100	.10U
indosulfan II	.100	.100	. 10U	.10u	.10U	.10U	.100	.100
4'-DDD'	.100	.10ນ	.100	.100	. 10u	.10u	.10U	.100
ndosulfan sulfate	.100	.100	. 100	. 100	.100	.100	.100	.100
.4*-DDT	.10µ	. 10U	.10U	.1ou	.10ರ	. 19U	.10U	.16u
lethoxychior	.50U	.50U	.50U	.50U	.50u	.50U·	.50U	.50u
indrin ketone	.100	. 100	.10U	.10⊎	.10U	_10U	.10U	.10U
itpha-Chilordane	.500	.50U	.500	.500	.50U	.50U	.50u	.50U
ramma-Chilordane	.50U	•50U `	.50U	.50U	.50U	.50U	.50u	.50U
oxaphene :	1.00	1.00	1.00	1.0u	1.00	1.00	1.00	1.00
troctor-1016	.50U	.50U	. 50U	.50U	.50U	.50u	.50U	.50U
roctor-1221	.500	.500	.50U	.50U	.50U	.50U	.500	.50u
roctor-1232	.50U	.50U	.500	.50u	.50U	.50U	.50u	.50u
roclar-1242	.500	.50U	.50U	. 50U	.50U	.50U	.500	,50U
roctor-1248	.50u	. 50U	.50U	.50U	.50U	.50U	.5 ₀ u	.50u
roctor-1254	1.00	1.00	1.00	1.00	1.00	1.00	1.0u	1-0U
troctor-1260	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

APPENDIX F.13 BUILDING M119 MCB Spill Report (August 27, 1976) OPNAV 5216/145 (Rev. 3-71) SN-0107-776-6110 USE FOR URGENT LETTERS, ONLY

Naval Speedlette.

DO NOT CLEAR THROUGH COMMUNICATIONS OFFICE

CHECK TYPE OF MAIL	CLASSIFICATION	
REGULAR REGISTERED		INSTRUCTIONS
X AIR CERTIFIED	Unclassified	1. Martin Sanaharaharaharaharah
	DATE IN REPLY REFER TO	1. Message type phraseology is permissible.
SPECIAL DELIVERY	27 August 1976 HAIN/JIM/th 11000	Both addresses must be appropriate for window envelope or bulk mailing, as intended. Include at-
	the Harine Corps (LFF-2) U. S. Marine Corps D. C. 20380	tention codes, when known. Use dots and brackets as guides for window envelope addresses. 3. Give priority to processing, routing, and action required. Avoid time-consuming controls. 4. In order to speed processing, a readily identifiable, special window envelope. OPNAV 5216/145A, Speedletter Envelope, is provided for unclassified speedletters where bulk mailing is not used. Other window envelopes also may be used. In bulk mail, speedletters should be placed on top of regular correspondence.

Fold STANDARD REFERENCES AND ENCLOSURES, IF ANY; TEXT AND SIGNATURE BLOCK

Subj: Oil Spill; report of

Ref: (a) MCO P11000.8A

- 1. The following report is forwarded in compliance with reference (a).
- a. At approximately 1430 on 25 August 1976, a spill of 200 gallons of gasoline occurred at Building M-119, Montford Point. The spill occurred when an underground storage tank overflowed during a fuel transfer operation. The spill was contained in a nearby ditch and cleaned up by Base Maintenance Department personnel.
- b. A report on the spill was made to Environmental Protection Agency and the U. S. Coast Guard by telephone on 27 August 1976.

G. C. FOX CHIEF OF STAFF MAN

Fold

copy to

Commanding General

Marine Corps Base

Camp Lejenne, North Carolina 28512

Camp Lejenne, North Carolina 28512

Unclassified

O'LL AND O'R HAZARDOUC SUBSTANCE ACCIDENT DISCHALL
25 and Spilled the porter to 1928
DATE: 29 Gray 76 INVESTIGATOR: Mn Maal
SPILL REPORTED BY: Fire Digit. TIME: 1430
location: M 119
SUBSTANCE SPILLED: Saroline. AMOUNT: 200 gal og mor
BY WHOM - PRIVATE: GOVERNMENT:
- RESPONSIBLE INDIVIDUAL/UNIT: Firel Farm Truck Driver Soft Colema
VEHICLE NUMBER: USMC 262754 Thoules 202694
CONTAINMENT MEASURES REQUIRED: Tix Dept. contain 6 the
in a mean by ditet
REMARKS: 1. CAUSE OF SPILL: Underground tank overflowed
as it was being refueled. Driver fell askiep
2. DAMAGE RESULTING FROM SPILL: L'Ille damage occurred
as the spill was contained near the spill with
Bose maint. Personnel removed the contaminable
soil and vill replace & reself.
EPA & US Coast Suard on the (SIGNATURE)
27 aug 76.

APPENDIX G
POTENTIAL CHEMICALS USED IN THE PROCESS OF
PARKERIZATION AND BLUING



 Products
 Chemicals Offered
 Chemicals Wanted
 AllChem Overview

 Credit
 NACD
 Divisions
 My AllChem.com

METAL FINISHING

The following is a listing of chemicals commonly used by this industry:

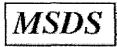
- · activated carbon
- ammonia
- · ammonium chloride
- · ammonium dichromate
- ammonium phosphates
- · barium carbonate
- barium salts
- boron salts
- cadmium
- calcium
- · carbon dioxide
- · carbon monoxide
- chromic acid
- chromium
- · chromium chloride
- · citric acid
- cyanide salts
- ethylenediaminetetraacetic acid
- ferricyanide
- fluorosilicate

- fluorozirconate
- fluorotitanate
- hydrochloric acid
- hydrofluoric acid
- hydrofluorosilicic acid
- iron chloride
- · iron phosphate
- lithium carbonate
- manganese
- · manganese phosphate
- methane
- methanol
- methylene chloride
- nickel
- nitric acid
- nitrogen
- oxalic acid
- · phosphoric acid
- potassium dichromate
- potassium fluoride

- potassium hydroxide
- · potassium silicates
- silicofluorides
- · sodium carbonate
- sodium cyanide
- sodium fluoride
- sodium hydroxide
- sodium hypophosphite
- sodium nitrite
- sodium phosphates
- sodium silicates
- sulfamic acid
- sulfuric acid
- tartaric acid
- tragacanth gum
- zinc chloride
- zinc metal
- zinc oxide
- zinc phosphate
- zinc sulfate

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Material Safety Data Sheet

From: Mallinckrodt Baker, Inc. 222 Red School Lane Phillipsburg, NJ 08865





24 Hour Emergency Telephone: 908-859-2151 CHEMTREC: 1-800-424-9300

National Response in Canada CANUTEC: 613-996-6666

Outside U.S. and Canada Chemtree: 703-527-3887

NOTE: CHEMITREC, CANUTEC and National Response Center emergency runnbers to be used only in the event of chemical emergencies involving a spill, leak, the, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SODIUM HYDROXIDE SOLUTIONS (MORE THAN 10% NaOH)

MSDS Number: S4037 --- Effective Date: 08/20/98

1. Product Identification

Synonyms: Caustic soda solution; lye solution; sodium hydroxide liquid; sodium hydrate solution, Sodium Hydroxide Concentrate Solution StandARd(R), Sodium Hydroxide, DILUT-IT(R) Analytical Concentrates, sodium hydroxide volumetric solutions

CAS No.: 1310-73-2 **Molecular Weight:** 40.00

Chemical Formula: NaOH in water

Product Codes:

J.T. Baker: 0337, 3719, 3725, 3727, 3729, 4689, 4690, 5000, 5661, 5666, 5668, 5669, 5671,

5672, 5674, 5676

Mallinckrodt: 6290, 7701, 7703, 7705, 7706, 7775, H369, H382, H385, V038, V039, V264

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
			~
Sodium Hydroxide Water	1310-73-2 7732-18-5	10 - 60% 40 - 90%	Yes No

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES BURNS TO ANY AREA OF CONTACT. REACTS WITH WATER, ACIDS AND OTHER MATERIALS.

J.T. Baker SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison) Flammability Rating: 0 - None Reactivity Rating: 2 - Moderate

Contact Rating: 4 - Extreme (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD;

PROPER GLOVES

Storage Color Code: White Stripe (Store Separately)

Potential Health Effects

Inhalation:

Severe irritant. Effects from inhalation of mist vary from mild irritation to serious damage of the upper respiratory tract, depending on severity of exposure. Symptoms may include sneezing, sore throat or runny nose. Severe pneumonitis may occur.

Ingestion:

Corrosive! Swallowing may cause severe burns of mouth, throat, and stomach. Severe scarring of tissue and death may result. Symptoms may include bleeding, vomiting, diarrhea, fall in blood pressure. Damage may appears days after exposure.

Skin Contact:

Corrosive! Contact with skin can cause irritation or severe burns and scarring with greater exposures.

Eye Contact:

Corrosive! Causes irritation of eyes, and with greater exposures it can cause burns that may result in permanent impairment of vision, even blindness.

Chronic Exposure:

Prolonged contact with dilute solutions or dust has a destructive effect upon tissue.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion:

DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact:

Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:

Perform endoscopy in all cases of suspected sodium hydroxide ingestion. In cases of severe esophageal corrosion, the use of therapeutic doses of steroids should be considered. General supportive measures with continual monitoring of gas exchange, acid-base balance, electrolytes, and fluid intake are also required.

5. Fire Fighting Measures

Fire:

Not considered to be a fire hazard. Hot or molten material can react violently with water. Can react with certain metals, such as aluminum, to generate flammable hydrogen gas.

Explosion:

May cause fire and explosions when in contact with incompatible materials.

Fire Extinguishing Media:

Use any means suitable for extinguishing surrounding fire. Adding water to caustic solution generates large amounts of heat.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Do not flush caustic residues to the sewer. Residues from spills can be diluted with water, neutralized with dilute acid such as acetic, hydrochloric or sulfuric. Absorb neutralized caustic residue on clay, vermiculite or other inert substance and package in a suitable container for disposal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRACIT(R)-2 or BuCAIM(R) caustic neutralizers are recommended for spills of this product.

7. Handling and Storage

Keep in a tightly closed container. Protect from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities. Store above 16C (60F) to prevent freezing. Always add the caustic to water while stirring; never the reverse. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product. Do not store with aluminum or magnesium. Do not mix with acids or organic materials.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

- OSHA Permissible Exposure Limit (PEL):
- 2 mg/m3 Ceiling
- ACGIH Threshold Limit Value (TLV):
- 2 mg/m3 Ceiling

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation*, A Manual of Recommended Practices, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Physical data is displayed for 10%, 30% and 50% aqueous sodium hydroxide solutions. (Merck Index).

Appearance:

Clear, colorless solution.

Odor:

Odorless.

Solubility:

Completely miscible with water.

Density:

10% solution - 1.11; 30% solution - 1.33; 50% solution - 1.53

pH:

14.0 (10%, 30% and 50% solutions)

% Volatiles by volume @ 21C (70F):

No information found.

Boiling Point:

For 10% solution = 105C (221F); for 30% solution = 115C (239F); for 50% solution = 140C (284F).

Melting Point:

For 10% solution = -10C (14 F); for 30% solution = 1C (34F); for 50% solution = 12C (53.6F).

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

13 @ 60C (140F) (50% solution)

Evaporation Rate (BuAc=1):

No information found.

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Sodium oxide. Decomposition by reaction with certain metals releases flammable and explosive hydrogen gas.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Sodium hydroxide in contact with acids and organic halogen compounds, especially trichloroethylene, may causes violent reactions. Contact with nitromethane and other similar nitro compounds causes formation of shock-sensitive salts. Contact with metals such as aluminum, magnesium, tin, and zinc cause formation of flammable hydrogen gas. Sodium hydroxide, even in fairly dilute solution, reacts readily with various sugars to produce carbon monoxide. Precautions should be taken including monitoring the tank atmosphere for carbon monoxide to ensure safety of personnel before vessel entry.

Conditions to Avoid:

Heat, moisture, incompatibles.

11. Toxicological Information

Sodium hydroxide: irritation data: skin, rabbit: 500 mg/24H severe; eye rabbit: 50 ug/24H

severe. Investigated as a mutagen.

\Cancer Lists\			
	NTP	Carcinogen	
Ingredient	Known	Anticipated	IARC Category

Sodium Hydroxide (1310-73-2)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate: No information found. Environmental Toxicity: No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: SODIUM HYDROXIDE SOLUTION

Hazard Class: 8 UN/NA: UN1824 Packing Group: II

Information reported for product/size: 360LB

International (Water, I.M.O.)

Proper Shipping Name: SODIUM HYDROXIDE, SOLUTION

Hazard Class: 8 UN/NA: UN1824 Packing Group: II

Information reported for product/size: 360LB

15. Regulatory Information

Ingredient 					Australi
Sodium Hydroxide (1310-73-2) Water (7732-18-5)		Yes	Yes	Yes	Yes Yes
\Chemical Inventory Status - Part	2\				
Ingredient		Korea	DSL		Phil.
Sodium Hydroxide (1310-73-2) Water (7732-18-5)			Yes	No No	Yes
\Federal, State & International F Ingredient	-SARA	302- TPO	 T.i s	SAR	A 313
	-SARA	A 302- TPQ No	Lis No	SAR	A 313 mical Cat No
Ingredient Sodium Hydroxide (1310-73-2)	-SAR/ RQ No No Regulati	A 302- TPQ NO NO LONS -	Lis No No No Part 2	SAR st Che 2\ 3 8	A 313 mical Cat No No No SCA-

Australian Hazchem Code: 2R

Poison Schedule: S6

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: 3 Flammability: 0 Reactivity: 1

Label Hazard Warning:

POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES BURNS TO ANY AREA OF CONTACT. REACTS WITH

WATER, ACIDS AND OTHER MATERIALS.

Label Precautions:

Do not get in eyes, on skin, or on clothing.

Do not breathe mist.

Keep container closed.

Use only with adequate ventilation.

Wash thoroughly after handling.

Label First Aid:

If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 10.

Disclaimer:

Mallingly and Dalvey Two magnides the information contained housing is good faith but

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Prepared by: Environmental Health & Safety Phone Number: (314) 654-1600 (U.S.A.)

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<u>A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Add</u>

Index

Pairing

Pairing Energy

<u>Palladium</u>

Paramagnetic atom

Paramagnetism

Parent nuclide

Partial Pressure

Partially miscible substances

Particulate Matter

Parts per billion

Parts per million

Pauli Exclusion Principle

Pauling

Peptide

Percent

Percent by Mass

Percent Composition

Percent error

Percent ionic character of a bond PHOSPHATES

Percent Purity

Percent yield

Percentage Ionization

Period

Periodic Law

Phosphoric Acid, chemical formula H₃PO₄, common acid of

phosphorus that is the source of industrially important compounds called phosphates. At room temperature, phosphoric acid is a crystalline material with a specific gravity of 1.83. The solid melts at 42.35° C (108.23° F). Phosphoric acid is usually stored and sold as a solution. Phosphoric acid is made by treating calcium phosphate rock with sulfuric acid, followed by <u>filtration</u> of the resultant <u>liquid</u> to remove calcium sulfate. It can be prepared also by burning phosphorus vapor and treating the resulting oxide with steam. The acid is useful in the laboratory because of its resistance to oxidation, to reduction, and to evaporation. Among the many uses of phosphoric acid are as an ingredient in soft drinks and dental cements, as a catalyst, in rustproofing metals, and in making phosphates, which are used in water softeners, fertilizers, and detergents.

Phosphates are products formed by the replacement of some or all of the hydrogen of a phosphoric acid by metals. Depending on the number of hydrogen atoms that are replaced, the

Periodic Table **Periodicity** Perkin Peroxide Petrolatum Phase Diagram Phase Rule Phenol **Phlogiston Phosgene** Phosphoric Acid Phosphorus Photochemical Oxidants Photochemical Smog Photochemistry Photoelectric Effect Photon Physical Change Physical Chemistry Physical property <u>Plasma</u> **Platinum** Plutonium Polar Bond Polar covalent bond Polar molecular solid Polar molecule <u>Polarimeter</u> **Polarization Polonium** Polyatomic ion **Polydentate** Polyene Polymer **Polymerization Polymorphous** Polyprotic Acid Position of equilibrium **Positron Potassium** Potential Energy Potential energy diagram <u>Praseodymium</u> **Precipitate Precipitation Precision Pressure Priestley** Primary Standard Primary Voltaic Cells **Products Promethium Propane Properties**

Protactinium Proton Proust resulting compound is described as a primary, secondary, or tertiary phosphate. For example, NaH₂PO₄, with one hydrogen atom replaced, is called primary <u>sodium</u> phosphate; Na₃PO₄, with three hydrogen atoms replaced, is called tertiary sodium phosphate. Also known as trisodium phosphate, tertiary sodium phosphate is valuable as a detergent and water softener. Primary and secondary **phosphates** contain hydrogen and are acid salts. Secondary and tertiary **phosphates**, with the exception of those of sodium, <u>potassium</u> and ammonium, are insoluble in water; the primary **phosphates** are more soluble.

Phosphates are important to metabolism in both plants and animals. Bones contain calcium phosphate, $Ca_3(PO_4)_2$, and the first step in the oxidation of glucose in the body is formation of a phosphate ester (see esters). To provide cattle with phosphate, dicalcium phosphate, $CaHPO_4 \cdot 2H_2O$, is used as a food supplement. Primary calcium phosphate, $Ca(H_2PO_4)_2$, is an ingredient of plant fertilizers.

Increasing attention has been focused on the environmentally harmful effects of **phosphates** in household detergents. Wastewater from laundering agents containing **phosphates** is known to be a water pollutant because **phosphates** are a primary nutrient of algae; when it grows in excess, algae can choke a lake or river and draw off needed <u>oxygen</u> from aquatic life.

Beginning in the 1970s, some regions of the United States and Canada banned or put strict limits on the amount of **phosphates** that detergents could contain.







X

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A B C D E F G H I J K L M N O P Q R S T U V W X Y Z Add

Index Macintosh Macromolecular solid Magnesium

Maltose Manganese

Manometer

Mass

Mass Action Expression

Mass Deficiency Mass Number

Mass Spectrometer

Mass-Volume percent

Match <u>Matter</u>

Maxim

Mechanism <u>Meitnerium</u>

Melting Point

<u>Mendelevium</u> <u>Mendeleyev</u>

Meniscus

Mercury

Metal

Metallic Bonding

Manganese, symbol Mn, silvery white, brittle metallic element Acoust used principally in making alloys. Manganese is one of the transition elements of the periodic table (see periodic law). The Magnetic Quantum Number atomic number of manganese is 25.

PROPERTIES AND OCCURRENCE

Manganese was first distinguished as an element in 1774 by the Swedish chemist Johan Gottlieb Gahn. Manganese metal corrodes in moist air and dissolves in acid. Manganese melts at about 1245° C (about 2271° F), boils at about 1962° C (about 3564° F), and has a specific gravity of 7.2; the atomic weight of Invert manganese is 54.938.

Pure manganese is obtained by igniting pyrolusite (manganese dioxide) with aluminum powder or by electrolyzing manganese sulfate. The metal does not occur in the free state, except in meteors, but is widely distributed over the world in the form of ores, such as rhodochrosite, franklinite, psilomelane, and manganite. It ranks about 12th in abundance among elements in the earth's crust. The principal ore of manganese is pyrolusite. Ukraine, Georgia, and South Africa are important producers of manganese.

Anthro Archae Archit Biolog **Biotec**

Chemi Dance Electr Enviro Fine A Geolog Plant_ **Politic**

Psycho

Sociol

Metallic Conduction Metallic solid Metalloid Metalloids Metallurgy

Metals Metathesis Reactions

Meter <u>Methane</u>

Method of Initial Rates

<u>Meyer</u> <u>Michel</u> <u>Mineral</u> **Miscibility**

Miscible substances

Mixture Moderator Molality

Molar Solubility Molar volume **Molarity**

Mole Mole Fraction

Molecular Equation Molecular Formula

Molecular Geometry Molecular Orbital

Molecular Orbital Theory

Molecular Weight Molecule

Molybdenum Monoatomic ion

Monoprotic Acid Mother Nuclide

Mulliken

USFS

Manganese is used principally in the form of alloys with iron, obtained by treating pyrolusite in a blast furnace with iron ore and carbon. The most important of these alloys, which are used in steelmaking, are ferromanganese, containing about 78 percent manganese, and spiegeleisen, containing from 12 to 33 percent manganese. Small amounts of manganese are added to steel as a deoxidizer; large amounts are used to produce a very tough alloy, resistant to wear. Safes, for example, are made of manganese steel containing about 12 percent manganese. Nonferrous manganese alloys include manganese bronze (composed of manganese, copper, tin, and zinc), which resists corrosion from seawater and is used for propeller blades on boats and torpedoes, and manganin (containing manganese, copper, and nickel), used in the form of wire for accurate Molar mass of a compound electrical measurements because its electrical conductivity does not vary appreciably with temperature.

> Manganese commonly forms compounds in which its valence is 2, 3, 4, 6, or 7. Manganese dioxide (MnO₂) occurs natively as pyrolusite and is prepared artificially by heating manganese nitrate; it is used in dry-cell batteries as a depolarizer, in paint and varnish oils, for coloring glass and ceramics, and in preparing chlorine and iodine. Manganese sulfate (MnSO₄), a pink crystalline solid, is prepared by the action of sulfuric acid on manganese dioxide and is used in dyeing cotton. Sodium and potassium permanganate (NaMnO₄) and KMnO₄) are dark purple crystals, formed by the oxidation of acidified manganese salts, which are used as oxidizers and disinfectants.





John Pfanstiehl



Albert S. Tarendash

<u>ABCDEFGHIJKLMNOPQRSTUVWXY</u>Z Add

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APPENDIX H
SITE WASTE MANAGEMENT UNITS INFORMATION

5.0 SUMMARY AND RECOMMENDATIONS

Baker conducted a Phase I Confirmatory Sampling Investigation of 62 SWMUs located at MCB, Camp Lejeune. The focus of this investigation was to determine which units need additional investigation and which require no further action. Of the 62 SWMUs, it is recommended that 20 SWMUs require no further action, and 42 require additional investigation. The results are discussed in detail in Section 4.0 of this report and the recommendations are summarized on Table 5-1.

Common laboratory contaminants such as acetone, methylene chloride, 2-butanone, toluene and phthalate esters were observed in samples collected during the investigation. In most cases, the concentrations observed in the samples were below the comparison criteria for the SWMU. Only at a few SWMUs did one (or more) of these compounds exceed criteria. If the compound was detected at a concentration exceeding comparison criteria, the exceedence was noted and was evaluated as to its relevance given the SWMUs operation and waste stream. For instance, if toluene was detected at levels exceeding comparison criteria at an oil/water separator, it is likely that the contamination is the result of operations at the SWMU because the unit is expected to handle petroleum-based waste. However, if acetone is detected in the vicinity of a concrete coal storage pad at levels exceeding comparison criteria, it would be reasoned that the presence of acetone was not SWMU-related since the compound is not used in the operations conducted at the unit. In cases where non-SWMU related compounds were the only compounds that exceeded the comparison criteria, additional investigation activities were not proposed.

The 42 SWMUs requiring additional investigative activities are as follows:

- SWMU 43 Pest Control Shop
- SWMU 46 Montford Point Dump Site
- SWMU 53 Coal Storage Area
- SWMU 89 SLCH785 Basin
- SWMU 253 1205 AST
- SWMU 254 1408 Dumpster
- SWMU 255 1502 Oil/Water Separator-1
- SWMU 256 1700 Oil/Water Separator-1
- SWMU 257 1700 Oil/Water Separator-2
- SWMU 258 S1745 Oil/Water Separator
- SWMU 261 1780 UST-1
- SWMU 264 2611 Container
- SWMU 265 2615 Oil/Water Separator
- SWMU 269 816 Oil/Water Separator
- SWMU 272 AS137 Oil/Water Separator
- SWMU 279 FC200 Oil/Water Separator
- SWMU 285 S947 Oil/Water Separator
- SWMU 291 034 Ditch
- SWMU 293 1106/1107 Oil/Water Separator
- SWMU 294 1203 Oil/Water Separator
- SWMU 295 1601 AST
- SWMU 296 1700 Basin B
- SWMU 297 1780 Oil/Water Separator-2
- SWMU 299 AS114 AST
- SWMU 300 AS118AST

- SWMU 302 AS504 AST
- SWMU 303 AS515 AST-E
- SWMU 305 BB224 Pile
- SWMU 306 FC230 Oil/Water Separator-1
- SWMU 307 G649 Rack
- SWMU 308 GP-19 Oil/Water Separator
- SWMU 311 S1619 Oil/Water Separator
- SWMU 312 S1735 Oil/Water Separator
- SWMU 313 S1753 Oil/Water Separator and AST
- SWMU 314 SM187 Oil/Water Separator
- SWMU 315 SM269 Oil/Water Separator
- SWMU 316 TC773 Oil/Water Separator
- SWMU 317 TT2453 Release
- SWMU 318 AS515 Oil/Water Separator
- SWMU 319 Camp Geiger Wastewater Treatment Plant
- SWMU 336 AS4106 Paint Stripper
- SWMU 339 AS146 Sand Blaster

Table 5-1 Summary of Recommendations Phase I SWMU Confirmatory Sampling Report, CTO-0371

MCB Camp Lejeune, North Carolina

•			Proposed	Sampling Under Phase I	I	
	Compounds Exceeding	Number of	Number of Surface	Number of Subsurface	Number of Temporary	Additional
SWMU Designation	Screening Criteria	Borings	Soil samples	Soil Samples	Monitoring Wells	Actions/Comments
SWMU 2 - 1700 Pond A						No further investigation actions recommended
SWMU 5 - 575 Rack						No further investigation actions recommended
SWMU 43 - Pest Control Shop	Chromium, 4,4'-DDD, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, 4,4'-DDT, Chlordane, Arsenic	3	8	3	3	
SWMU 46 - Montford Point Dump Site	Cadmium, Lead, Arsenic	6	6	6	6	Geophysical survey is recommended to establish the boundary of the historic landfill
SWMU 53 - Coal Storage Area	Benzo(a)pyrene, Arsenic	3	3	3	3	
SWMU 89 - SLCH785 Basin	1,1,2,2 - Tetrachloroethane, Bromoform, 4-Methyl-2- pentanone, Ethylbenzene, Methylene Chloride, 2- Methylnaphthalene, Naphthalene					Additional investigation activities to be covered under proposed RI/FS at Building 45
SWMU 253 - 1205 AST	Benzo(a)pyrene, Arsenic	3	3	3	3	
SWMU 254 - 1408 Dumpster	Benzo(a)anthracene, Benzo(a)Pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Carbazole, Indeno(1,2,3- cd)pyrene, Dibenz(a,h)anthracene	3		3	3	
SWMU 255 - 1502 O/W-1	Benzo(a)pyrene, Pentachlorophenol	Î		2	1	

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Summary of Recommendations Phase I SWMU Confirmatory Sampling Report, CTO-0371 MCB Camp Lejeune, North Carolina

			Proposed	Sampling Under Phase I	I	
	Compounds Exceeding	Number of	Number of Surface	Number of Subsurface	Number of Temporary	Additional
SWMU Designation	Screening Criteria	Borings	Soil samples	Soil Samples	Monitoring Wells	Actions/Comments
SWMU 256 - 1700 O/W-1	Benzo(a)pyrene	3	3	3	3	
SWMU 257 - 1700 O/W-2	Benzo(a)pyrene	3	3	3	3	
SWMU 258 - S1745 O/W	Acetone, Cadmium, Mercury	3	4	3	3	Resample SWMU258-IS05- 00 for VOCs only
SWMU 260 - 1780 O/W-1						No further investigation actions recommended
SWMU 261 - 1780 UST-1	Cadmium, Chromium, Lead	5	2	5	3	Two surface soil samples will be collected from the drainage ditch
SWMU 262 - 1780 UST-2						No further investigation actions recommended
SWMU 264 - 2611 Container	Arsenic, Pentachlorophenol	1		1	1	
SWMU 265 - 2615 O/W	Benzo(a)pyrene	3	3	3	3	
SWMU 268 - 522 Dumpster						No further investigation actions recommended
SWMU 269 - 816 O/W	Arsenic	3	3	3	3	
SWMU 272 - AS137 O/W	Benzo(a)pyrene, 2- Chlorophenol, 4-Chloro-3- methylphenol, Pentachiorophenol, Arsenic	5	3	5	3	
SWMU 273 - BA128/BA105 Dumpster						No further investigation actions recommended
SWMU 275 - BA-48 Dumpster						No further investigation actions recommended
SWMU 276 - BB-49 Dumpster						No further investigation actions recommended
SWMU 277 - FC120 O/W						No further investigation actions recommended
SWMU 279 - FC200 O/W	Benzo(a)pyrene	3		3	2	One groundwater sample to be collected from existing monitoring well.

Table 5-1 Summary of Recommendations Phase I SWMU Confirmatory Sampling Report, CTO-0371 MCB Camp Lejeune, North Carolina

	Compounds Exceeding	Number of	Number of Surface	Number of Subsurface	Number of Temporary	Additional
SWMU Designation	Screening Criteria	Borings	Soil samples	Soil Samples	Monitoring Wells	Actions/Comments
SWMU 280 - FC285 AST						No further investigation actions recommended
SWMU 283 - FC279 Release						No further investigation actions recommended
SWMU 284 - S947 Container						No further investigation actions recommended
SWMU 285 - S947 O/W	Methylene chloride, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene	2	2	2	3	One of the three recommended monitoring wells is to be installed at boring location SWMU 285-IS03
SWMU 286 - S947 Pile						No further investigation actions recommended
SWMU 291 - 034 Ditch	Chromium	6	· · · · · · · · · · · · · · · · · · ·	6	3	
SWMU 292 - 1106/1107 AST						No further investigation actions recommended
SWMU 293 - 1106/1107 O/W	Lead	3	12	3	3	
SWMU 294 - 1203 O/W	Mercury, Benzo(a)pyrene	7	7	7	3	
SWMU 295 - 1601 AST	Naphthalene, Arsenic, 2- Methylnaphthalene	3		3	2	Groundwater sample to be collected from existing monitoring well 78GW09-1
SWMU 296 - 1700 Basin B	Benzo(a)pyrene, Arsenic			· · · · · · · · · · · · · · · · · · ·		See SWMU 53
SWMU 297 - 1780 O/W-2						See SMWU 261
SWMU 298 - 1780 O/W-3						No further investigation actions recommended

Table 5-1
Summary of Recommendations
Phase I SWMU Confirmatory Sampling Report, CTO-0371
MCB Camp Lejeune, North Carolina

	Compounds Exceeding	Number of	Number of Surface	Number of Subsurface	Number of Temporary	Additional
SWMU Designation	Screening Criteria	Borings	Soil samples	Soil Samples	Monitoring Wells	Actions/Comments
SWMU 299 - ASI 14 AST	Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(a)pyrene, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene	6	6	6	3	
-	Arsnic, Cadmium, Chromium, Lead, Silver					
SWMU 300 - AS118 AST	Benzo(a)pyrene, Benzo(b)fluoranthene		3			
SWMU 301 - AS4115 AST						No further investigation actions recommended
SWMU 302 - AS504 AST	Cadmium, Benzo(a)pyrene, Dibenz(a,h)anthracene	3	3	3	3	Proposed temporary monitoring well to be installed at boring SWMU302-IS02
SWMU 303 - AS515 AST-E	Acetone, Arsenic, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene		6			Resample soil boring SWMU303-IS04 for VOCs only
SWMU 304 - BA130 O/W						No further investigation actions recommended
SWMU 305 - BB224 Pile	Arsenic	5	5	5	3	
SWMU 306 - FC230 O/W-1	Silver	3		3	3	
SWMU 30 7 - G649 Rack	Mercury, Arsenic	2	3	2	3	One of the proposed wells should be installed near SWMU307-IS01
SWMU 308 - GP-19 O/W	Bis(2-chloroethyl) ether		3			
SWMU 309 - NH118 UST						No further investigation actions recommended
SWMU 310 - PT33 Pond O/W					i	No further investigation actions recommended

Table 5-1
Summary of Recommendations
Phase I SWMU Confirmatory Sampling Report, CTO-0371
MCB Camp Lejeune, North Carolina

		Ī	, , , , , , , , , , , , , , , , , , , ,			
· ·	Compounds Exceeding	Number of	Number of Surface	Number of Subsurface	Number of Temporary	Additional
SWMU Designation	Screening Criteria	Borings	Soil samples	Soil Samples	Monitoring Wells	Actions/Comments
SWMU 311 - S1619 O/W	Chlorobenzene, Lead,	6	6	6	3	
	Cadmium, Chromium,	İ				
	Mercury, Arsenic	;			•	
SWMU 312 - S1735 O/W	Benzo(a)pyrene, Arsenic	3	6	3	3	
SWMU 313 - S1753 O/W & AST	Silver, Arsenic		3			
SWMU 314 - SM187 O/W	Arsenic, Benzo(a)pyrene		8			
SWMU 315 - SM269 O/W	Pentachlorophenol,	4	4	4	3	
	Arsenic, Mercury, Silver					
SWMU 316 - TC773 O/W	Arsenic, Benzo(a)pyrene	3	6	3	3	
SWMU 317 - TT2453 Release	Lead	3	3	3	3	
SWMU 318 - AS515 O/W	1,2-Dichlorobenzene, 1,4-Dichlorobenzene, Benzo(a)anthracene, Benzo(a)Pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenz(a,h)anthracene, Indeno(1,2,3-cd)pyrene, Naphthalene, Cadmium, Chromium, Mercury, Silver, Arsenic	3	6	3	3	It is recommended that three of the surface soil samples be collected from the drainage ditch
SWMU 319 - Camp Geiger Wastewater Treatment Plant	Benzo(a)pyrene, Benzo(a)anthracene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Mercury	ž.	1	1		
SWMU 336 - AS4106 Paint Stripper		2	2	2	2	-
SWMU 337 - AS518 Paint Stripper						No further investigation actions recommended

Table 5-1

Summary of Recommendations Phase I SWMU Confirmatory Sampling Report, CTO-0371 MCB Camp Lejeune, North Carolina

		Proposed Sampling Under Phase II				
	Compounds Exceeding	Number of	Number of Surface	Number of Subsurface	Number of Temporary	Additional
SWMU Designation	Screening Criteria	Borings	Soil samples	Soil Samples	Monitoring Wells	Actions/Comments
SWMU 339 - AS146 Sandblaster	Acetone, 4-Methylphenol	4		4	3	Resample VOCs and SVOCs
						in boring SWMU339-IS01;
						Controls to eliminate the
						transportation of
			,			contaminated sand and grit
						into the stormwater
				*		collection system

APPENDIX H.1 BUILDING HP1124 SITE WASTE MANAGEMENT UNITS 292 AND 293 (BAKER, NOVEMBER 2001)

4.25 <u>SWMUs 292 (1106/1107 Aboveground Storage Tank) and 293 (1106/1107 Oil/Water Separator)</u>

The following sections present the SWMU description and history, the investigation activities conducted during the Confirmatory Investigation, investigation findings, and recommendations.

4.25.1 SWMU Description and History

SWMU 292 is a 500-gallon AST that contains waste oil and antifreeze from the auto repair/hobby shop located along Michael Road. SWMU 293 is a poured concrete in-ground oil/water separator with baffles. The outlet for the oil/water separator is connected to the wastewater treatment plant. Both the AST and oil/water separator have been in operation since 1980. The oil/water separator contains waste oil, antifreeze, and possibly solvents. During the site visit conducted by Baker in 1996, spills/stains were noted on the concrete flooring of the open-bay garage structure housing the AST. In addition, oil was observed in the grit chambers of the oil/water separator, and the wash pad was stained and cracked. It is suspected that solvents used for degreasing may have been disposed through the oil/water separator. A SWMU investigation plan is presented as Figure 1.

4.25.2 Confirmatory Investigation Activities

The Confirmatory Investigation was conducted on September 14 and September 15, 1997. The purpose of the investigation was to determine if operation of the AST and oil/water separator have impacted surface and subsurface soils in the vicinity of the SWMU. The field procedures were performed in accordance with the Project Plans (Baker, 1997).

Four soil borings were advanced in the vicinity of the two SWMUs (see Figure 1). Groundwater was encountered in the borings at approximately 9 feet bgs. Two samples were collected from each boring at depths of 0 to 2 feet bgs and 4 to 6 or 6 to 8 feet bgs. In addition, a field duplicate sample (SWMU 293-IS01-03D) was collected.

The soil samples were submitted to Quanterra Laboratories and analyzed for VOCs (EPA Methods 8260 and 8020), SVOCs (EPA Method 8270), and RCRA metals (EPA Method 6010/7410). The analytical results for the soil samples are presented in Appendix D; results for the field duplicate sample are presented in Appendix E.

4.25.3 Investigation Findings

The laboratory analytical results for positive detections in soil are summarized on Tables 1 and 2 were compared to the following screening criteria on Tables 3 and 4:

- AOC background values
- Base background values
- NC DENR default soil to groundwater values
- USEPA Region IX residential PRGs

Figure 1 presents the distribution of contaminants the exceed the applicable screening criteria.

Six VOCs were detected in the sample set, as follows: acetone, methylene chloride; tetrachloroethene; 1,3-dichlorobenzene; 1,4-dichlorobenzene; and toluene. None of the concentrations exceeded the applicable screening criteria.

One SVOC [bis(2-ethylhexyl)phthalate] was detected in the sample set. None of the concentrations exceeded the applicable screening criteria.

Five metals were detected in the sample set, as follows: barium, chromium, lead, mercury, and selenium. Barium, chromium, and selenium exceeded the AOC and/or base background screening criteria in one or more of the samples; however, the concentrations were below the NC DENR and USEPA Region IX screening criteria. Lead and mercury exceeded the AOC and/or base background and NC DENR soil to groundwater screening criteria in the surface soil samples.

4.25.4 Conclusions

Based on evaluation of the analytical results, lead exceeded the background and NC DENR soil to groundwater screening criteria. Therefore, additional investigation at SWMUs 293 is warranted. The additional investigation activities are presented in Section 5.0.

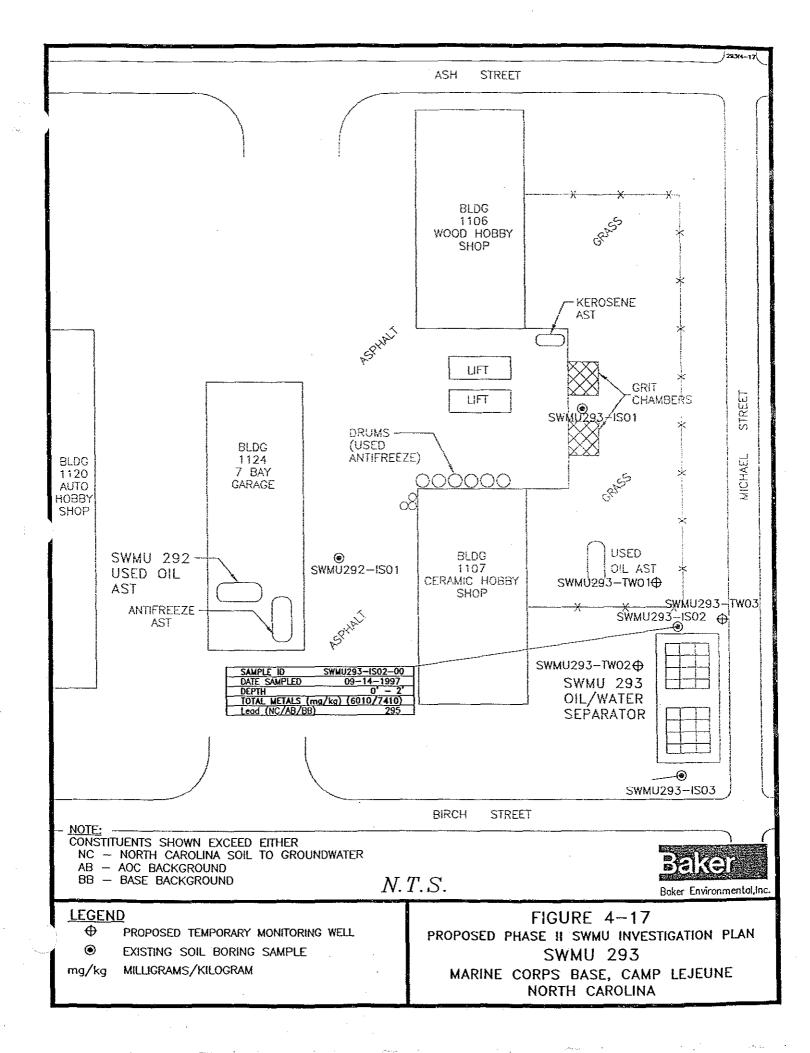


TABLE 1

DETECTION SUMMARY SURFACE SOIL - SWMU 292 / 293 SWMU CONFIRMATORY SAMPLING (CTO-0371) MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID DATE SAMPLED DEPTH	SWMU292-IS01-00 09-15-1997 0' - 2'	SWMU293-IS01-00 09-14-1997 0' - 2'	SWMU293-IS02-00 09-14-1997 0' - 2'	SWMU293-IS03-00 09-14-1997 0' - 2'
VOLATILES (ug/kg)				
Acetone	. 860	42 J	22 U	23 U
Methylene chloride	6.1	8.1 J	3.5 J	1.9 J
Tetrachloroethene	5.8 U	5.3 U	6.2	5.8 U
1,3-Dichlorobenzene	1.2 U	1.1 U	4.1	1.2 U
1,4-Dichlorobenzene	1.2 U	3.9	1.1 U	1.2 U
Toluene	1.2 U	1.1	1.1 U	1.2 U
SEMIVOLATILES (ug/kg)				
bis(2-Ethylhexyl) phthalate	120 J	160 J	80 J	75 J
TOTAL METALS (mg/kg)				
Barium	23.3 U	21.3 U	41.5	23.1 U
Chromium	6.2	12	10.6	9.1
Lead	4	66	295	26.2
Mercury	0.071	0.043	0.045	0.04
Selenium	0.64	0.53 ∪	0,56 ∪	0.58 U

Notes:

_____ - Exceeds background concentrations

Bold - Exceeds NC DENR soil to groundwater comparison criteria

<u>Underlined</u> - Exceeds USEPA Region IX Residential PRGs

U - Not detected

J - Analyte present - Reported value is estimated

TABLE 2

DETECTION SUMMARY SUBSURFACE SOIL - SWMU 292 / 293 SWMU CONFIRMATORY SAMPLING (CTO-0371) MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID DATE SAMPLED DEPTH	SWMU292-IS01-03 09-15-1997 6' - 8'	SWMU293-IS01-03 09-14-1997 6' - 8'	SWMU293-IS02-03 09-14-1997 6' - 8'	SWMU293-IS03-02 09-14-1997 4' - 6'
VOLATILES (ug/kg)				
Acetone	22 U	160	47	140
Methylene chloride	2 J	1.9 J	2.2 J	2 J
SEMIVOLATILES (ug/kg)				
bis(2-Ethylhexyl) phthalate	120 Ј	55 J	39 J	100 J
TOTAL METALS (mg/kg)				
Chromium	4.1	4.5	3.2	9.4
Lead	2.2	6.6	2.7	20.8

Notes:

- Exceeds background concentrations

Bold - Exceeds NC DENR soil to groundwater comparison criteria

Underlined - Exceeds USEPA Region IX Residential PRGs

U - Not detected

J - Analyte present - Reported value is estimated

TABLE 3

SURFACE SOIL DATA AND STATISTICAL SUMMARY SWMU CONFIRMATORY SAMPLING CTO-371: SMWU 292 / 293 MCB, CAMP LEJEUNE JACKSONVILLE, NC

	Comparison Criteria			Contaminant Fre	ontaminant Frequency / Range Number of Exceedences Above Comparison Criteria			Criteria	Comparison Criteria		
	Backgr	ound ^(I)	NC DENR	USEPA Region IX	No. of Positive	Range	Positive Detects	Positive Detects	Positive Detects	Positive Detects	USEPA Region IX
Contaminant	AOC	Base	Soil to Groundwater	PRGs	Detects /	of Positive	Above AOC	Above Base	Above NC DENR	USEPA Region IX	PRGs
	Background	Background	Values -	Residential Soil	No. of Samples	Detections	Background	Background	Soil to Groundwater	Residential Soil	Industrial Soil
VOLATILES (ug/kg)											
Acetone	NE	NE	2,810	1,600,000	2/4	42 J - 860	NA	NA	0	0	6,200,000
Methylene chloride	NE	NE	22.0	8,900	4/4	1.9 J - 8.1 J	NA	NA	0	0	21,000
Tetrachloroethene	NE	NE	7.4	5,700	1/4	6.2	NA	NA	0	0	19,000
1,3-Dichlorobenzene	NE	NE	23,700	13,000	1/4	4.1	NA	NA	0	0	52,000
1,4-Dichlorobenzene	NE	NE	1,240	3,400	1/4	3.9	NA	NA.	0	0 ·	8,100
Toluene	NE	NE	7,275	520,000	1/4	1,1	NA	NA	0	0	520,000
SEMIVOLATILES (ug/kg)											
bis(2-Ethylhexyl) phthalate	NE	NE	6,670	35,000	4/4	75 J - 160 J	NΛ	NA NA	00	0	180,000
TOTAL METALS (mg/kg)							THE COMMON PLEASE CONTRACTOR OF COMMON PROPERTY AND COMMON PROPERT	Lotte Name at Verlagging Point May Vince by on any leaves			
Barium	4.5 - 13.2	0.73 - 18.9	848	5,400	1/4	41.5			0	0	100,000
Chromium	1.4 - 6.05	0.24 - 7.62	27.2	210	4/4	6,2 - 12	Shahari 4 stoletan		0	0	450
Lead	2.6 - 15.5	0.45 - 18.9	270	400	4/4	4 - 295	第8指数3點隔離		计编列设计 电电路	0	750
Mercury	0.019 - 0.039	0.020 - 0.082	0.0154	23	4/4	0.04 - 0.071	3/4/34 4 34 4 (3)		calcomen 4 mondonic	0	610
Selenium	0.24 - 0.39	0.25 - 0.55	12,2	390	1/4	0.64	5.481666	s lead to	0	0	10,000

Notes:

NA - Not Applicable

J - Analyte present - Reported value is estimated

NE - Not Established

(1) Background concentrations were collected for inorganics AOC comparison - AOC 6 Surface Soil

Base comparison - Combined Base Surface Soil

TABLE 4

SUBSURFACE SOIL DATA AND STATISTICAL SUMMARY SWMU CONFIRMATORY SAMPLING CTO-371: SMWU 292 / 293 MCB, CAMP LEJEUNE JACKSONVILLE, NC

		Comparison Criteria				Contaminant Frequency / Range Number of Exceedences Above Comparison Comparis			Criteria	Comparison Criteria	
	Backgr	ound (1)	NC DENR	USEPA Region IX	No. of Positive	Range	Positive Detects	Positive Detects	Positive Detects	Positive Detects	USEPA Region IX
Contaminant	AOC	Base	Soil to Groundwater	PRGs	Detects /	of Positive	Above AOC	Above Base	Above NC DENR	USEPA Region IX	PRGs
	Background	Background	Values	Residential Soil	No. of Samples	Detections	Background	Background	Soil to Groundwater	Residential Soil	Industrial Soil
VOLATILES (ug/kg)					i						
Acetone	NE	NE	2,810	1,600,000	3/4	47 - 160	NA	NA	0	0	6,200,000
Methylene chloride	NE	NE	22.0	8,900	4/4	1.9 J - 2.2 J	NA	NA	0	0	21,000
SEMIVOLATILES (ug/kg)											
bis(2-Ethylhexyl) phthalate	NE	NE	6,670	35,000	4/4	39 J - 120 J	NA	NA	0	0	180,000
TOTAL METALS (mg/kg)											
Chromium	1.4 - 11.0	1.9 - 25.0	27.2	210	4/4	3,2 - 9.4	0	0	0	0	450
Lead	1.1 - 6.86	1 - 9.19	270	400	4/4	2,2 - 20.8	企业制度		0	0	750

Notes:

NA · Not Applicable NE · Not Established J - Analyte present - Reported value is estimated

(1) Background concentrations were collected for inorganics
AOC comparison - AOC 6 Subsurface Soil
Base comparison - Silt Subsurface Soil

SWMU 292/293 ORGANIC COMPOUNDS SWMU CONFIRMATORY SAMPLING (CTO-0371) 1106/1107 - O/W, MOTOR T - AUTO HOBBY SHOP MWR MCB, CAMP LEJEUNE, NORTH CAROLINA

DEPTH 0°-2' 0'-2	SAMPLE ID LAB ID DATE SAMPLED	SWMU292-IS01-00 H71170166006 09-15-1997	SWMU292-IS01-03 H71170166007 09-15-1997	SWMU293-IS01-00 H7I170166008 09-14-1997	SWMU293-IS01-03 H71170166009	SWMU293-IS02-00 H71170166011	SWMU293-IS02-03 H7I170166012
Vol.ATILES (ug/kg) (82.60A) S. U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 1,1,1-Trichlorosthane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 1,1,2-Trichlorosthane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 1,1-Dichlorosthane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 1,1-Dichlorosthane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 1,2-Dichlorosthane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 1,2-Dichlorosthane (otal) 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 1,2-Dichlorosthane (otal) 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 1,2-Dichlorosthane (otal) 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 1,2-Dichlorosthane (otal) 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 2-Petarono 23 U 2						•	
1,1-Trichloroethane		V 2	V V	U - Z	0 - 0	.	0 - 0
1,1,2-Trichlorosthane	VOLATILES (ug/kg) (8260A)						
1,12-Trichloroethane	1,1,1-Trichloroethane	5.8 U	์ 5.5 ป	5.3 U	5.3 U	5.6 U	5.5 U
	1,1,2,2-Tetrachloroethane	5.8 U	5,5 U	5.3 U	5.3 U	5.6 U	5.5 U
						5.6 U	5.5 U
1,2-Dichloroethane (total) 3,8 U 5,5 U 5,3 U 5,3 U 5,5 U 5,5 U 1,2-Dichloroethene (total) 3,8 U 5,5 U 5,5 U 5,3 U 5,3 U 5,6 U 5,5 U 2,2-Dichloroethene (total) 3,8 U 3,5 U 3,3 U 5,3 U 5,6 U 5,5 U 2,2-Dichloroethene (total) 3,8 U 3,5 U 3,3 U 3,3 U 3,6 U 3,5 U 2,2 U	1,1-Dichloroethane	5.8 U	5.5 U	5.3 U	5.3 U	5.6 U	5.5 U
1,2-Dichloroptenee (total)	1,1-Dichloroethene	5.8 U	5.5 U	5.3 U	5.3 U	5.6 U	5.5 U
1,2-Dichloropropane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 2-Butanone 23 U 22 U 21 U 21 U 21 U 22 U 42 J 160 22 U 47 60 52 U 52 U 53 U 53 U 53 U 56 U 55 U 55 U 53 U 53 U 53 U 56 U 55 U 55 U 53 U 53 U 56 U 55 U 55 U 53 U 53 U 56 U 55 U 55 U 53 U 53 U 56 U 55 U 53 U 53 U	1,2-Dichloroethane	5,8 U	5.5 U	5.3 U	5,3 U -	5.6 U	5.5 U
2-Butanone 23 U 22 U 21 U 21 U 22 U 22 U 2-Remande 23 U 22 U 21 U 21 U 21 U 22 U 22 U 24 U 21 U 21	1,2-Dichloroethene (total)	5,8 U	5.5 U	5.3 U	5.3 U	5.6 U	5.5 U
2-Hexanone	1,2-Dichloropropane	5.8 U	5.5 U	5.3 U	5.3 U	5.6 U	5.5 U
2-Hexanone	2-Butanone	23 U	22 U	21 U	21 U	22 U	22 U
4-Methyl-2-pentanone 23 U 22 U 21 U 21 U 22 U 42 J Acetone 860 22 U 42 J 160 22 U 47 Benzene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Bromoferm 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Bromoferm 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Bromoferm 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Carbon testachoride 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Chlorotestane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Chlorotestane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Chlorotestane 12 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U <	2-Hexanone	23 U	22 U	21 U	21 U	22 U	22 U
Acetone 860 22 U 42 J 160 22 U 47 Benzene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Bromodichloromethane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Bromoferm 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Bromofethane 12 U 11 U </td <td>4-Methyl-2-pentanone</td> <td>23 U</td> <td>22 U</td> <td>21 U</td> <td></td> <td></td> <td></td>	4-Methyl-2-pentanone	23 U	22 U	21 U			
Benzene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Bromodichloromethane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Bromomethane 12 U 11 U	· •						
Bromodichloromethane						and the second s	
Bromoform	Bromodichloromethane	5,8 U					
Brommethane 12 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.3 U 5.5 U 5.5 U 5.3 U 5.3 U 5.5 U 5.5 U 5.3 U 5.3 U 5.5 U 5.5 U 5.3 U 5.3 U 5.5 U 5.5 U 5.5 U 5.3 U 5.3 U 5.5 U 5.5 U 5.5 U 5.3 U 5.3 U 5.5 U 5.5 U 5.3 U							
Carbon disulfide 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Carbon tetrachloride 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Chlorobenzene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Chlorochlane 12 U 11 U							
Carbon tetrachloride 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Chlorobenzene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Chlorothane 12 U 11 U<							
Chlorobenzene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Chloroethane 12 U 11 U 1							
Chloroethane 12 U 11 U							
Chloroform 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Chloromethane 12 U 11							
Chloromethane 12 U 11 U 5.5 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U 5.5							
cis-1,3-Dichloropropene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Dibromochloromethane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Ethylbenzene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Methylene chloride 6.1 2 J 8.1 J 1.9 J 3.5 J 2.2 J Styrene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Tetrachloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Toluene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U trans-1,3-Dichloropropene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Trichloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Vinyl chloride 12 U 11 U 11 U 11 U 11 U 11 U 11 U							
Dibromochloromethane 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Ethylbenzene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Methylene chloride 6.1 2 J 8.1 J 1.9 J 3.5 J 2.2 J Styrene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Tetrachloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.3 U 5.6 U 5.5 U Toluene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Trichloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Trichloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Vinyl chloride 12 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U							· ·
Ethylbenzene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Methylene chloride 6.1 2 J 8.1 J 1.9 J 3.5 J 2.2 J Styrene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Tetrachloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.3 U 6.2 5.5 U Toluene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U trans-1,3-Dichloropropene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Trichloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Vinyl chloride 12 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U 11 U	- •						•
Methylene chloride 6.1 2 J 8.1 J 1.9 J 3.5 J 2.2 J Styrene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Tetrachloroethene 5.8 U 5.5 U 5.3 U 5.3 U 6.2 5.5 U Toluene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U trans-1,3-Dichloropropene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Trichloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Vinyl chtoride 12 U 11 U							
Styrene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Tetrachloroethene 5.8 U 5.5 U 5.3 U 5.3 U 6.2 5.5 U Toluene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U trans-1,3-Dichloropropene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Trichloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Vinyl chtoride 12 U 11 U	-						
Tetrachloroethene 5.8 U 5.5 U 5.3 U 5.3 U 6.2 5.5 U Toluene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U trans-1,3-Dichtoropropene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Trichtoroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Vinyl chloride 12 U 11 U <							
Toluene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U trans-1,3-Dichloropropene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Trichloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Vinyl chloride 12 U 11 U	•						
trans-1,3-Dichloropropene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Trichloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Vinyl chloride 12 U 11 U							
Trichloroethene 5.8 U 5.5 U 5.3 U 5.3 U 5.6 U 5.5 U Vinyl chtoride 12 U 11 U <							
Vinyl chloride 12 U 11 U 11 U 11 U 11 U 11 U							
	Xylenes (total)	5,8 U	5.5 U	5.3 U	5.3 U	5.6 U	5,5 U

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OUNDS MPLING (CTO-0371) SWMU CONFIRMATOI MPLING (CTO-0371) 1106/1107 - O/W, MOTOR T - AUTO HOBBY SHOP MWR MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID LAB ID DATE SAMPLED DEPTH	SWMU292-IS01-00 H7I170166006 09-15-1997 . 0'-2'	SWMU292-IS01-03 H7I170166007 09-15-1997 6' - 8'	SWMU293-I801-00 H71170166008 09-14-1997 0' - 2'	SWMU293-IS01-03 H7I170166009 09-14-1997 6' - 8'	SWMU293-IS02-00 H71170166011 09-14-1997 0' - 2'	SWMU293-IS02-03 H71170166012 09-14-1997 6' - 8'
VOLATILES (ug/kg) (8020)						
1,2-Dichlorobenzene	1,2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
1,3-Dichlorobenzene	1.2 U	1.1 U	1.1 U	1.1 U	4.1	1.1 U
1,4-Dichlorobenzene	1.2 U	1.1 U	3.9	1,1 U	1.1 U	1.1 U
Benzene	1.2 U	1.1 U	. I.1 U	1,1 U	1. 1 U	1.1 U
Chlorobenzene	1.2 U	1.1 U	1.1 U	. 1.1 U	1.1 U	1.1 U
Ethylbenzene	1.2 U	1.1 U	1.1 U	1,1 U	1.1 U	1.1 U
Toluene	1.2 U	1.1 U	1:1	1.1 U	1.1 U	1.1 U
Xylenes (total)	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U

SWMU 292/293 ORGANIC COMPOUNDS SWMU CONFIRMATORY SAMPLING (CTO-0371) 1106/1107 - O/W, MOTOR T - AUTO HOBBY SHOP MWR MCB, CAMP LEJEUNE, NORTH CAROLINA

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SAMPLE ID	SWMU292-IS01-00	SWMU292-IS01-03	SWMU293-IS01-00	SWMU293-IS01-03	SWMU293-IS02-00	SWMU293-IS02-03
LAB ID	H71170166006	H7I170166007	H71170166008	H71170166009	H71170166011	H7I170166012
DATE SAMPLED	09-15-1997	09-15-1997	09-14-1997	09-14-1997	09-14-1997	09-14-1997
DEPTH	0' - 2'	6' - 8'	0' - 2'	6' - 8'	0' - 2'	6' - 8'
SEMIVOLATILES (ug/kg) (8270)						<u>.</u>
1,2,4-Trichlorobenzene	390 U	360 U	350 U	350 U	370 U	360 U
1,2-Dichlorobenzene	390 U	360 U	350 U	350 U	370 U	360 U
1,3-Dichlorobenzene	390 U	360 U	350 U	350 U	370 U	360 U
1,4-Dichlorobenzene	390 U	360 U	350 U	350 U	370 U	360 U
2,2'-Oxybis(1-Chloropropane)	390 ป	360 U	350 U	350 U	370 U	360 U
2,4,5-Trichlorophenol	390 U	360 U	350 U	350 U	370 U	360 U
2,4,6-Trichlorophenol	390 U	360 U	350 U	350 U	370 U	360 U
2,4-Dichlorophenol	390 U	360 U	350 U	350 U	370 U	360 U
2,4-Dimethylphenol	390 U	360 U	350 U	350 U	370 U	360 U
2,4-Dinitrophenol	1900 U	1800 U	1700 U	1700 U	1800 U	1700 U
2,4-Dinitrotoluene	390 U	360 U	350 U	350 U	370 U	360 U
2,6-Dinitrotoluene	390 U	360 U	350 U	350 U	370 U	360 U
2-Chloronaphthalene	390 U	360 U	350 U	350 U	370 U	360 U
2-Chlorophenol	390 U	360 U	350 U	350 U	370 U	360 U
2-Methylnaphthalene	390 U	360 U	350 U	350 U	370 U	360 U
2-Methylphenol	390 U	360 U	350 U	350 U	370 U	360 U
2-Nitroaniline	1900 U	1800 U	1700 U	1700 U	1800 U	1700 U
2-Nitrophenol	390 U	360 U	350 U	350 U	370 U	360 U
3,3'-Dichlorobenzidine	1900 U	1800 U	1700 U	1700 U	1800 U	1700 U
3-Nitroaniline	1900 U	1800 U	1700 U	1700 U	1800 U	1700 U
4,6-Dinitro-2-methylphenol	1900 U	1800 U	1700 U	1700 U	1800 U	1700 U
4-Bromophenyl phenyl ether	390 U	360 U	350 U	350 U	370 U	360 U
4-Chloro-3-methylphenol	390 U	360 U	350 U	350 U	370 U	360 U
4-Chloroaniline	390 U	360 U	350 U	350 U	370 U	360 U
4-Chlorophenyl phenyl ether	390 U	360 U	350 U	350 U	370 U	360 U
4-Methylphenol	390 U	360 U	350 U	350 U	370 U	360 U
4-Nitroaniline	1900 U	1800 U	1700 U	1700 U	1800 U	1700 U
4-Nitrophenol	1900 U	1800 U	1700 U	1700 U	1800 U	1700 U
Acenaphthene	390 U	360 U	350 U	350 U	370 U	360 U
Acenaphthylene	390 U	360 U	350 U	350 U	370 U	360 U
Anthracene	390 U	360 U	350 U	350 U	370 U	360 U
Benzo(a)anthracene	390 U	360 U	350 U	350 U	370 U	360 U
Benzo(a)pyrene	390 U	360 U	350 U	350 U	370 U	360 U

SWMU 73 ORGANIC C JUNDS

SWMU CONFIRMATOI MPLING (CTO-0371) 1106/1107 - O/W, MOTOR T - AUTO HOBBY SHOP MWR MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID LAB ID	SWMU292-IS01-00 H7I170166006	SWMU292-IS01-03 H7I170166007	SWMU293-IS01-00 H7I170166008	SWMU293-IS01-03 H7I170166009	SWMU293-IS02-00 H71170166011	SWMU293-IS02-03 H7I170166012
DATE SAMPLED	09-15-1997	09-15-1997	09-14-1997	09-14-1997	09-14-1997	09-14-1997
DEPTH	0' - 2'	6' - 8'	0' - 2'	6' - 8'	0' - 2'	6' - 8'
SEMIVOLATILES (ug/kg) (8270) (cont)	•					
Benzo(b)fluoranthene	390 U	360 U	350 U	350 U	370 U	360 U
Benzo(ghi)perylene	390 U	360 U	350 U	350 U	370 U	360 U
Benzo(k)fluoranthene	390 U	360 U	350 U	350 U	370 U	360 U
bis(2-Chloroethoxy)methane	390 U	360 U	350 U	350 U	370 U	360 U
bis(2-Chloroethyl) ether	390 U	360 U	350 U	350 U	370 U	360 U
bis(2-Ethylhexyl) phthalate	120 J	120 J	160 J	55 J	80 J	39 J
Butyl benzyl phthalate	390 U	360 U	350 U	350 U	370 U	360 U
Carbazole	390 U	360 U	350 U	350 U	370 U	360 U
Chrysene	390 U	360 U	350 U	350 U	370 U	360 U
Dibenz(a,h)anthracene	390 U	360 U	350 U	350 U	370 U	360 U
Dibenzofuran	390 U	360 U	350 U	350 U	370 U	360 U
Diethyl phthalate	390 U	360 U	350 U	350 U	370 U	360 U
Dimethyl phthalate	390 U	360 U	350 U	350 U	370 U	360 U
Di-n-butyl plithalate	390 U	360 U	350 U	350 U	370 U	360 U
Di-n-octyl phthalate	390 U	360 U	350 U	350 U	370 U	360 U
Fluoranthene	390 U	360 U	350 U	350 U	370 U	360 U
Fluorene	390 U	360 U	350 U	350 U	370 U	360 U
Hexachlorobenzene	390 U	360 U	350 U	350 U	370 U	360 U
Hexachlorobutadiene	390 U	360 U	350 U	350 U	370 U	360 U
Hexachlorocyclopentadiene	1900 U	1800 U	1700 U	1700 U	1800 U	1700 U
Hexachloroethane	390 U	360 U	350 U	350 U	370 U	360 U
Indeno(1,2,3-cd)pyrene	390 U	360 U	350 U	350 U	370 U	360 U
Isophorone	· 390 U	360 U	350 U	350 U	370 U	360 U
Naphthalene	390 U	360 U	350 U	350 U	370 U	360 U
Nitrobenzene	390 U	360 U	350 U	350 U	370 U	360 U
N-Nitrosodi-n-propylamine	390 U	360 U	350 U	350 U	370 U	360 U
N-Nitrosodiphenylamine	390 U	360 U	350 U	350 U	370 U	360 U
Pentachlorophenol	1900 U	1800 U	1700 U	1700 U	1800 U	1700 U
Phenanthrene	390 U	360 U	350 U	350 U	370 U	360 U
Phenol	390 U	360 U	350 U	350 U	370 U	360 U
Pyrene	390 U	360 U	350 U	350 U	370 U	360 U

SWMU 292/293 ORGANIC COMPOUNDS

SWMU CONFIRMATORY SAMPLING (CTO-0371) 1106/1107 - O/W, MOTOR T - AUTO HOBBY SHOP MWR MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU293-IS03-00	SWMU293-IS03-02
LAB ID	H7I170166013	H71170166014
DATE SAMPLED	09-14-1997	09-14-1997
DEPTH	0' - 2'	4' - 6'
VOLATILES (ug/kg) (8260A)		·
1,1,1-Trichloroethane	5.8 U	5.7 U
1,1,2,2-Tetrachloroethane	5.8 U	5.7 U
1,1,2-Trichloroethane	5.8 U	5.7 U
1,1-Dichloroethane	5.8 U	5.7 U
1,1-Dichloroethene	5.8 U	5.7 U
1,2-Dichloroethane	5.8 U	5.7 U
1,2-Dichloroethene (total)	5.8 U	5.7 U
1,2-Dichloropropane	5.8 U	5.7 U
2-Butanone	23 U	23 U
2-Hexanone	23 U	23 U
4-Methyl-2-pentanone	· 23 U	23 U
Acetone	23 U	140
Benzene	5.8 U	5.7 ป
Bromodichloromethane	5.8 U	5.7 U
Bromoform	5.8 U	5.7 U
Bromomethane	12 U	11 U
Carbon disulfide	5.8 U	5.7 U
Carbon tetrachloride	5.8 U	5.7 U
Chlorobenzene	5.8 U	5.7 U
Chloroethane	12 U	11 U
Chloroform	5.8 U	5.7 U
Chloromethane	12 U	11 U
cis-1,3-Dichloropropene	5.8 U	5.7 U
Dibromochloromethane	5.8 U	5.7 U
Ethylbenzene	5.8 U	5.7 U
Methylene chloride	1.9 J	2 J
Styrene	5.8 U	5.7 U
Tetrachloroethene	5.8 U	5.7 U
Toluene	5,8 U	5.7 U
trans-1,3-Dichloropropene	5.8 U	5.7 U
Trichloroethene	5.8 U	5.7 U
Vinyl chloride	12 U	11 U
Xylenes (total)	5.8 U	5.7 U

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SWMU CONFIRMATOK .MPLING (CTO-0371) 1106/1107 - O/W, MOTOR T - AUTO HOBBY SHOP MWR MCB, CAMP LEJEUNE, NORTH CAROLINA

SWMU293-IS03-00	SWMU293-IS03-02
H71170166013	H7I170166014
09-14-1997	09-14-1997
0' - 2'	4' • 6'
1.2 U	1.1 U
1.2 U	1.1 U
1.2 U	1.1 U
1,2 U	1.1 U
1.2 U	1.1 U
1.2 U	1.1 U
1.2 U	i.1 U
1.2 U	1.1 U
	H71170166013 09-14-1997 0'-2' 1.2 U 1.2 U 1.2 U 1.2 U 1.2 U 1.2 U

SWMU 292/293

ORGANIC COMPOUNDS

SWMU CONFIRMATORY SAMPLING (CTO-0371) 1106/1107 - O/W, MOTOR T - AUTO HOBBY SHOP MWR MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU293-IS03-00	SWMU293-IS03-02
LAB ID	H71170166013	H7I170166014
DATE SAMPLED	09-14-1997	09-14-1997
DEPTH	0' - 2'	4' - 6'
SEMIVOLATILES (ug/kg) (8270)	200 11	200 11
1,2,4-Trichlorobenzene	380 U	380 U
1,2-Dichlorobenzene	380 U	380 U
1,3-Dichlorobenzene	380 U	380 U
1,4-Dichlorobenzene	380 U	380 U
2,2'-Oxybis(1-Chloropropane)	380 U	380 U
2,4,5-Trichlorophenol	380 U	380 U
2,4,6-Trichlorophenol	380 U	380 U
2,4-Dichlorophenol	380 U	380 U
2,4-Dimethylphenol	380 U	380 U
2,4-Dinitrophenol	1900 U	1800 U
2,4-Dinitrotoluene	380 U	380 U
2,6-Dinitrotoluene	380 U	380 U
2-Chloronaphthalene	380 U	380 U
2-Chlorophenol	380 U	380 U
2-Methylnaphthalene	380 U	380 U
2-Methylphenol	380 U	380 U
2-Nitroaniline	1900 U	1800 U
2-Nitrophenol	380 U	380 U
3,3'-Dichlorobenzidine	1900 U	1800 U
3-Nitroaniline	1900 U	1800 U
4,6-Dinitro-2-methylphenol	1900 U	1800 U
4-Bromophenyl phenyl ether	380 U	380 U
4-Chloro-3-methylphenol	380 U	380 U
4-Chloroaniline	380 U	380 U
4-Chlorophenyl phenyl ether	380 U	380 U
4-Methylphenol	380 U	380 U
4-Nitroaniline	1900 U	1800 U
4-Nitrophenoi	1900 U	1800 U
Acenaphthene	380 U	380 U
Acenaphthylene	380 U	380 U
Anthracene	380 U	380 U
Benzo(a)anthracene	380 U	380 U
Benzo(a)pyrene	380 U	380 U
Dormo(n)bligge	2.00	

SWMU! 3

ORGANIC C JUNDS

SWMU CONFIRMATORMPLING (CTO-0371) 1106/1107 - O/W, MOTOR T - AUTO HOBBY SHOP MWR MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU293-IS03-00	SWMU293-IS03-02
LAB ID	H71170166013	H7I170166014
DATE SAMPLED	09-14-1997	09-14-1997
DEPTH	0' - 2'	4' - 6'
SEMIVOLATILES (ug/kg) (8270) (cont)		
Benzo(b)fluoranthene	380 U	380 U
Benzo(ghi)perylene	380 U	380 U
Benzo(k)fluoranthene	380 U	380 U
bis(2-Chloroethoxy)methane	380 U	380 U
bis(2-Chloroethyl) ether	380 U	380 U
bis(2-Ethylhexyl) phthalate	75 J	100 J
Butyl benzyl phthalate	380 U	380 U
Carbazole	380 U	380 U
Chrysene	380 U	380 U
Dibenz(a,h)anthracene	380 U	380 U
Dibenzofuran	380 U	380 U
Diethyl phthalate	380 U	380 U
Dimethyl phthalate	380 U	380 U
Di-n-butyl phthalate	380 U	380 U
Di-n-octyl phthalate	380 U	380 U
Fluoranthene	380 U	380 U
Fluorene	380 U	380 U
Hexachlorobenzene	380 U	380 U
Hexachlorobutadiene	380 U	380 U
Hexachlorocyclopentadiene	1900 U	1800 U
Hexachloroethane	380 U	380 U
Indeno(1,2,3-cd)pyrene	380 U	380 U
Isophorone	380 U	380 U
Naphthalene	380 U	380 U
Nitrobenzene	380 U	380 U
N-Nitrosodi-n-propylamine	380 U	380 U
N-Nitrosodiphenylamine	380 U	380 U
Pentachlorophenol	1900 U	1800 U
Phenanthrene	380 U	380 U
Phenol	380 U	380 U
Pyrene	380 U	380 U
- y		

SWMU 292/293 TOTAL INORGANICS

SWMU CONFIRMATORY SAMPLING (CTO-371) 1106/1107 - O/W, MOTOR T - AUTO HOBBY SHOP MWR MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID LAB ID DATE SAMPLED DEPTH	SWMU292-IS01-00 H7I170166006 09-15-1997 0' - 2'	SWMU292-IS01-03 H71170166007 09-15-1997 6' - 8'	SWMU293-IS01-00 H71170166008 09-14-1997 0' - 2'	SWMU293-1801-03 H71170166009 09-14-1997 6' - 8'	SWMU293-IS02-00 H71170166011 09-14-1997 0' - 2'	SWMU293-1802-03 H71170166012 09-14-1997 6' - 8'
TOTAL METALS (mg/kg) (6010/7410)						
Arsenic	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Barium	23.3 U	22 U	21.3 U	21.1 U	· 41.5	21.9 U
Cadmium	0.58 U	0.55 U	0.53 U	0.53 U	. 0.56 U	0.55 U
Chromium	6.2	4.1	12	4,5	10.6	3.2
Lead	. 4	2.2	66	6,6	295	2.7
Mercury	0.071	0.036 U	0.043	0.035 U	0.045	0.036 U
Selenium	0.64	0,55 U	0.53 U	0.53 U	0.56 U	0.55 U
Silver	1.2 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U

SWMU 93 TOTAL INC...JANICS

SWMU CONFIRMATORY SAMPLING (CTO-371) 1106/1107 - O/W, MOTOR T - AUTO HOBBY SHOP MWR MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU293-IS03-00	SWMU293-IS03-02
LAB ID	H7I170166013	1471170166014
DATE SAMPLED	09-14-1997	09-14-1997
DEPTH	0' - 2'	4' - 6'
TOTAL METALS (mg/kg) (6010/7410)		
Arsenic	1.2 U	1.1 U
Barium	23.1 U	23 U
Cadmium	0.58 U	0.57 U
Chromium	9.1	9,4
Lead	26.2	20,8
Mercury	0.04	0.038 U
Selenium	0.58 U	0.57 U
Silver	1.2 U	. 1.1 บ

APPENDIX H.2 BUILDING AS116 SITE WASTE MANAGEMENT UNIT 299 (BAKER, NOVEMBER 2001)

4.28 SWMU 299 - AS114 Aboveground Storage Tank MCAS Auto Hobby Shop

The following sections present the SWMU description and history, the investigation activities conducted during the Confirmatory Investigation, investigation findings, and recommendations.

4.28.1 SWMU Description and History

SWMU 299 consists of an AST that stores used oil generated from a Hobby Shop located in the Marine Corps Air Station (MCAS). The SWMU is located west of Bancroft Road adjacent to Buildings AS-114 and AS-116. The ground surface surrounding the SWMU is covered with asphalt except for a small grassy area located to the north. The steel tank was installed in 1992 and is still used. At the time of the investigation, significant staining was noted on the outside of the tank, apparently resultant from overfills/spills. Stormwater travels across the pavement to the narrow grassy area north of the SWMU. A SWMU investigation plan is presented on Figure 1.

4.28.2 Confirmatory Investigation Activities

The Confirmatory Sampling Investigation was conducted on September 14, 1997. The purpose of the investigation was to determine if overfills and spills associated with the AST have impacted surface and subsurface soils. The field procedures were performed in accordance with the approved Project Plans submitted in 1997 (Baker, 1997).

Four soil borings were advanced in the grassy area just north of the SWMU (Figure 1). Groundwater was encountered in the boring at a depth of approximately 2 to 4 feet bgs. A soil sample was collected from each boring at a depth of 0 to 2 feet bgs. A single subsurface soil sample was collected from soil boring SWMU 299-IS04 at a depth of 2 to 4 feet bgs. The remaining soil borings encountered groundwater at a depth of 2 feet bgs which precluded the collection of subsurface soil samples. All of the soil borings could not be accessed by a drill rig because of the access restrictions caused by the AST, the wash pad, and the fence. Therefore, they were advanced via a tripod-mounted split-spoon sampling apparatus.

The samples submitted to Quanterra Laboratories and analyzed for VOCs (USEPA Method 8020), SVOCs (USEPA Method 8270), and RCRA metals (USEPA Method SW846 6010/7410). A copy of the analytical results for the soil samples are presented in Appendix D.

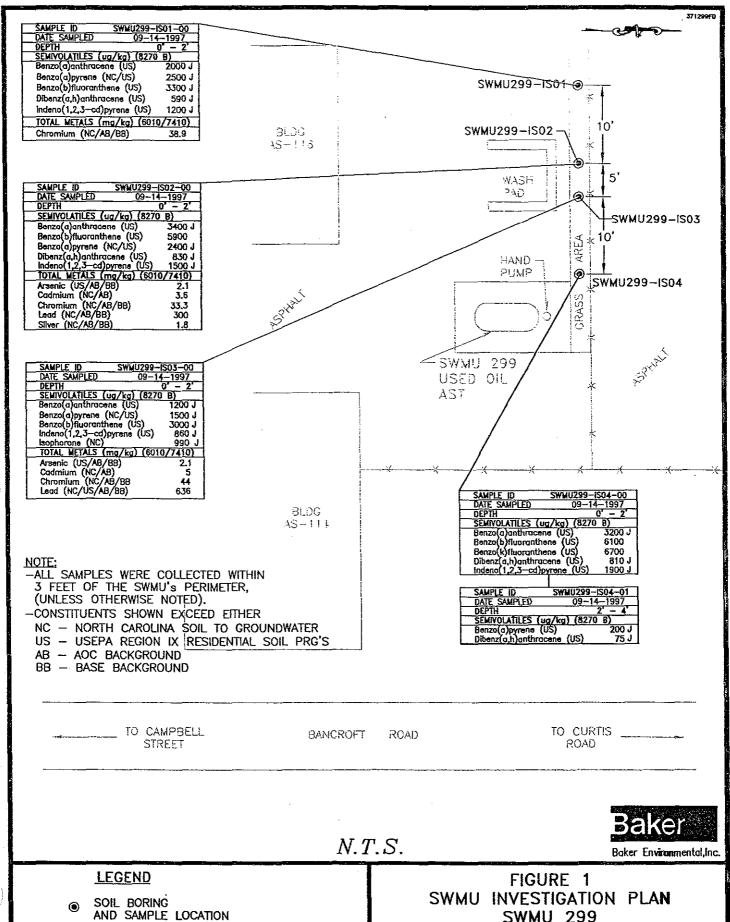
4.28.3 Investigation Findings

The laboratory analytical results for positive detections are summarized on Tables 1 and 2, and compared to the following screening criteria shown Tables 3 and 4:

- AOC background values
- Base background values
- NC DENR default and site-specific soil to groundwater values
- USEPA Region IX residential PRGs

Figure 1 presents the distribution of contaminants that exceed the applicable screening criteria.

Five VOCs were detected in the sample set. None of the VOCs (except for ethylbenzene) exceeded the applicable screening criteria. Ethylbenzene exceeded the NC DENR default screening criteria. As a result, a site-specific screening value was calculated. None of the ethylbenzene concentrations exceeded the NC DENR site-specific screening criteria.



mg/kg MILLIGRAM/KILOGRAM MICROGRAM/KILOGRAM ug/kg

SWMU 299 MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA

Twenty-two (22) SVOCs (mostly PAHs), were detected in the sample set. Several of the SVOCs exceeded the NC DENR default screening criteria. Except for benzo(a)pyrene, the concentrations were below the site-specific screening criteria calculated for the those compounds. Benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeded the USEPA Region IX residential PRGs in one or more of the samples. None of the other SVOCs detected in the samples exceeded the applicable screening criteria.

Seven metals (arsenic, barium, cadmium, chromium, lead, mercury, and silver) were detected in the sample set. Barium exceeded the background screening criteria in one or more of the samples; however, the concentrations were below the NC DENR and USEPA Region IX screening criteria. The remaining six metals exceeded the background screening criteria and the NC DENR and/or USEPA Region IX screening criteria.

4.28.4 Conclusions

Based on the evaluation of the analytical results, several SVOCs and metals were detected at concentrations that exceeded the applicable screening criteria. Therefore, additional investigation is warranted at SWMU 299. The additional investigative activities are presented in Section 5.0.

TABLE 1

DETECTION SUMMARY SURFACE SOIL - SWMU 299 SWMU CONFIRMATORY SAMPLING (CTO-0371) MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU299-IS01-00	SWMU299-1S02-00	SWMU299-IS03-00	SWMU299-1S04-00
DATE SAMPLED	09-14-1997	09-14-1997	09-14-1997	09-14-1997
DEPTH	0' - 2'	0' - 2'	0' - 2'	0' - 2'
VOLATILES (ug/kg)				
1,2-Dichlorobenzene	770	960	470	100
1,3-Dichlorobenzene	550	1600	140 U	67 U
1,4-Dichlorobenzene	860	470	200	270
Ethylbenzene	270 U	620	570	71
Xylenes (total)	2600	4300	2600	470
SEMIVOLATILES (ug/kg)				
2-Methylnaphthalene	1200 J	3100 J	6600	1900 J
Acenaphthene	4400 U	830 J	780 J	4400 U
Anthracene	490 J	1100 J	4700 U	810 J
Benzo(a)anthracene	<u>2000</u> J	<u>3400</u> J	<u>1200</u> J	<u>3200</u> J
Benzo(a)pyrene	2500 J	2400 J	<u>1500</u> J	4400 U
Benzo(b)fluoranthene	3300 J	5900	<u>3000</u> J	<u>6100</u>
Benzo(ghi)perylene	1000 J	1500 J	810 J	1800 J
Benzo(k)fluoranthene	3500 J	3600 J	2000 J	6700
bis(2-Ethylhexyl) phthalate	11000 J	16000 J	7600 J	6600 J
Butyl benzyl phthalate	7800	2600 J	3800 J	2900 J
Carbazole	4400 U	870 J	4700 U	4400 U
Chrysene	3500 J	4800	2000 J	4800
Dibenz(a,h)anthracene	590 J	830 J	4700 U	810 J
Dibenzofuran	4400 U	730 J	4700 U	4400 U
Di-n-butyl phthalate	3700 J	1600 J	4700 U	4400 U
Fluoranthene	4900	7500	2600 J	6100
Fluorene	510 J	1700 J	1100 J	560 J
Indeno(1,2,3-cd)pyrene	1200 J	1500 J	860 J	1900 J
	4400 U	4300 U	990 J	4400 U
Isophorone	970 J	1900 J	640 J	950 J
Naphthalene		7000	4200 J	3100 J
Phenanthrene	2300 J		3000 J	7600
Pyrene	4200 J	7100	2000 J	/000

TABLE 1 (Continued)

DETECTION SUMMARY SURFACE SOIL - SWMU 299 SWMU CONFIRMATORY SAMPLING (CTO-0371) MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU299-IS01-00	SWMU299-IS02-00	SWMU299-1S03-00	SWMU299-1S04-00
DATE SAMPLED	09-14-1997	09-14-1997	09-14-1997	09-14-1997
DEPTH	0' - 2'	0' - 2'	0' - 2'	0' - 2'
TOTAL METALS (mg/kg)				
Arsenic	1.3 U	21	21	1 2 11
		2.1	4.1	1.3 U
Barium	29.7	185	72.2	26.6 U
Cadmium	1.8	3.6	5	0.67 U
Chromium	38.9	33.3	44	14
Lead	193	300	636	56.1
Mercury	0.078	0.1	0.069	0.044 U
Silver	1.3 U	1.8	1.4 U	1.3 U

Notes:

- Exceeds background concentrations

Bold - Exceeds NC DENR soil to groundwater comparison criteria

<u>Underlined</u> - Exceeds USEPA Region IX Residential PRGs

- U Not detected
- J Analyte present Reported value is estimated

TABLE 2

DETECTION SUMMARY SUBSURFACE SOIL - SWMU 299 SWMU CONFIRMATORY SAMPLING (CTO-0371) MCB, CAMP LEJEUNE, NORTH CAROLINA

	•
SAMPLE ID	SWMU299-IS04-01
DATE SAMPLED	09-14-1997
DEPTH	2' - 4'
VOLATILES (ug/kg)	
1,2-Dichlorobenzene	3.5
1,4-Dichlorobenzene	7.8
Ethylbenzene	2.2
Xylenes (total)	3.6
SEMIVOLATILES (ug/kg)	
2-Methylnaphthalene	54 J
Anthracene	61 J
Benzo(a)anthracene	200 J
Benzo(a)pyrene	<u>200</u> J
Benzo(b)fluoranthene	330 J
Benzo(ghi)perylene	120 J
Benzo(k)fluoranthene	350 J
bis(2-Ethylhexyl) phthalate	160 J
Butyl benzyl phthalate	43 J
Chrysene	260 J
Dibenz(a,h)anthracene	<u>75</u> J
Fluoranthene	640
Indeno(1,2,3-cd)pyrene	130 J
Naphthalene	48 J
Phenanthrene	320 J
Pyrene	380 J
TOTAL METALS (mg/kg)	
Chromium	4.9
Lead	5.7

Notes:

- Exceeds background concentrations

Bold - Exceeds NC DENR soil to groundwater comparison criteria

Underlined - Exceeds USEPA Region IX Residential PRGs

U - Not detected

J - Analyte present - Reported value is estimated

TABLE 3

SURFACE SOIL DATA AND STATISTICAL SUMMARY SWMU CONFIRMATORY SAMPLING CTO-371: SMWU 299 MCB, CAMP LEJEUNE JACKSONVILLE, NC

	Comparison Criteria							Number of Exceedences Above Comparison Criteria			Comparison Criteria
	Backg	round ⁽¹⁾	NC DENR	USEPA Region IX	No. of Positive	Range	Positive Detects	Positive Detects	Positive Detects	Positive Detects	USEPA Region IX
Contaminant	AOC	Base	Soil to Groundwater	PRGs	Detects /	of Positive	Above AOC	Above Base	Above NC DENR	USEPA Region IX	PRGs
	Background	Background	Values	Residential Soil	No. of Samples	Detections	Background	Background	Soil to Groundwater	Residential Soil	Industrial Soil
VOLATILES (ug/kg)											
1,2-Dichlorobenzene	NE	NE	7,270	370,000	4/4	100 - 960	NA	NA	0	0	370,000
1,3-Dichlorobenzene	NE	NE	. 23,700	13,000	2/4	550 - 1600	NA	NA	0	0	52,000
1,4-Dichlorobenzene	NE	NE	1,240	3,400	4/4	200 - 860	NA	NA	0	0	8,100
Ethylbenzene	NE	NE	1,396 (2)	230,000	3/4	71 - 620	NA	NA	0	0	230,000
Xylenes (total)	NE	NE	4,958	210,000	4/4	470 - 4300	NA	NA	0	0	210,000
SEMIVOLATILES (ug/kg)										
2-Methylnaphthalene	NE	NE	13,621 (2)	1,600,000	4/4	1200 J - 6600	NA	NA	0	0	NE
Acenaphthene	NE	NE	8,161	3,700,000	2/4	780 J - 830 J	NA	NA	0	0	38,000,000
Anthracene	NE	NE	995,410	22,000,000	3/4	490 J - I 100 J	NA	NA	0	0	100,000,000
Benzo(a)anthracene	NE	NE	3,690 (2)	620	4/4	1200 J - 3400 J	NA	NA	0	超過機能到46個與20	2,900
Benzo(a)pyrene	NE	NE	980 (2)	62.0	3/4	1500 J - 2500 J	NΛ	NA	dections and to	高級 医乳腺素素	290
Benzo(b)fluoranthene	NE	NE	12,441 (2)	620	4/4	3000 J - 6100	NΛ	NA	0	30278301476483163	2,900
Benzo(ghi)perylene	NE	NE	6,720,000	2,300,000	4/4	810 J - 1800 J	NΛ	NA	0	0	NE
Benzo(k)fluoranthene	NE	NE	22,574	6,200	4/4	2000 J • 6700	NA	. NA	0	A格用斯克拉10年/图14年	29,000
bis(2-Ethylhexyl) phthalate	NE	NE	71,674 (2)	35,000	4/4	6600 J - 16000 J	NA	NA	0	0	180,000
Butyl benzyl phthalate	NE	NE	27,800	12,000,000	4/4	2600 J - 7800	NA	NA	0	0	100,000,000
Carbazole	NE	NE	2,494 (2)	32,000	1/4	870 J	NA	NA	0	0	NE
Chrysene	NE	NE	39,800	62,000	4/4	2000 J - 4800	NΛ	NA	0	0	290,000
Dibenz(a,h)anthracene	NE	NE	1,810 ⁽²⁾	62,0	3/4	590 J • 830 J	NA	NA	Ö	HANGE BUILDER	290
Dibenzofuran	NE	NE	4,102	290,000	1/4	730 J	NA	NA.	0	0	5,100,000
Di-n-butyl phthalate	NE	NE	24,780	6,100,000	2/4	1600 J - 3700 J	NA	NA	0	0	88,000,000
Fluoranthene	NE	NE	276,080	2,300,000	4/4	2600 J - 7500	NA	NA	0	0	30,000,000
Fluorene	NE	NE	44,297	2,600,000	4/4	510 J - 1700 J	NA	NΛ	0	0	33,000,000
Indeno(1,2,3-cd)pyrene	NE	NE	3,260	620	4/4	860 J - 1900 J	NA	ŇA	0	明斯斯斯伊A斯姆·斯	2,900
Isophorone	NE	NE	518 ⁽²⁾	510,000	1/4	990 J	NA	NA			2,600,000
Naphthalene	NE	NE	5,463 ⁽²⁾	56,000	4/4	640 J - 1900 J	NA	NA	0	0	190,000
Phenanthrene	NE	NE	59,641	2,300,000	4/4	2300 J - 7000	NA	NA	0	0	NE
Pyrene	NE	NE	286,440	2,300,000	4/4	3000 J - 7600	NA	NA	. 0	0	54,000,000
TOTAL METALS (mg/kg)											
Arsenic	0,32 - 1.83	0,49 - 1.34	26	0.39	2/4	2.1 - 2.1	44.244	10.76	0	de 1800 21, 55 m	2,700
Barium	1 - 21.49	3.9 - 23.33	848	5400	3/4	29.7 - 185	高 建 选 前 张 4	神神神道的物	0	0	100,000,000
Cadmium	0.029 - 0.02	NE	3	37	3/4	1,8 - 5		NA	20010162000000	0	810,000
Chromium	2.2 - 13.06	2.3 - 12.25	27	210	4/4	14 + 44	10 m 34 W 12 T	的基本基础报告		0	450,000
Lead	2.2 - 22.65	3.2 - 26.05	270	400	4/4	56.1 - 636	推定 经存货基	HOUSEA SHARE	通过地区 4000	14 (30 IV)	750,000
Mercury	0.02 - 0.06	0.032 - 0.13	0	23	3/4	0.069 - 0.1	图形线动脉点	0	rate le de 3 le de 1871		610,000
Silver	0.097 - 0.14	0.097 - 0.17	0	390	1/4	1.8	NATIONAL (中) 原	網球線料學線線影響	建物的基本的	0	10,000,000

Notes:

NA - Not Applicable

NE - Not Established

(1) Background concentration were collected for inorganics

AOC comparison - AOC 2 Surface Soil

Base comparison - Loam-Silt Surface Soil

(2) Detected concentrations exceed NC DENR generic soil-to-groundwater criteria. Therefore, site-specific criteria were calculated using a TOC of 10,760 mg/kg.

TABLE 4

SUBSURFACE SOIL DATA AND STATISTICAL SUMMARY SWMU CONFIRMATORY SAMPLING CTO-371: SMWU 299 MCB, CAMP LEJEUNE JACKSONVILLE, NC

			nparison Criteria		Contaminant Fre	equency / Range	Nun	iber of Exceedence	s Above Comparison	Criteria	Comparison Criteria
	Backgr	ound ⁽¹⁾	NC DENR	USEPA Region IX	No. of Positive	Range	Positive Detects	Positive Detects	Positive Detects	Positive Detects	USEPA Region IX
Contaminant	AOC	Base	Soil to Groundwater	PRGs	Detects /	of Positive	Above AOC	Above Base	Above NC DENR	USEPA Region IX	PRGs
	Background	Background	Values	Residential Soil	No. of Samples	Detections	Background	Background	Soil to Groundwater	Residential Soil	Industrial Soil
VOLATILES (ug/kg)											
1,2-Dichlorobenzene	NE	NE	7,270	370,000	1/1	3.5	NA	NA	0	0	370,000
1,4-Dichlorobenzene	NE	NE	1,240	3,400	1/1	7.8	NA	NA	0	0	8,100
Ethylbenzene	NE .	NE	241	230,000	1/1	2,2	NA	NA	0	0	230,000
Xylenes (total)	NE	NE	4,958	210,000	1/1	3,6	NA	NA	0	0	210,000
SEMIVOLATILES (ug/kg)				1					1		
2-Methylnaphthalene	NE	NE	1,367	1,600,000	1/1	54 J	NA	NA	0	0	NE_
Anthracene	NE	NE	995,410	22,000,000	1/1	61 J	NA	NA	0	0	100,000,000
Benzo(a)anthracene	NE	NE	358	620	1/1	200 J	NA	NA	0	0	2,900
Benzo(a)pyrene	NE	NE	980 (2)	62,0	1/1	200 J	NA	NA	0	(III ye (Lilandate)	290
Benzo(b)fluoranthene	NE	NE	2,257	620	1/1	330 J	NA	NA	0	0	2,900
Benzo(ghi)perylene	NE	NE	6,720,000	2,300,000	1/1	120 J	NA	NA	. 0	0	NE
Benzo(k)fluoranthene	NE	NE	22,574	6,200	1/1	350 J	NA	NA	0	0	29,000
bis(2-Ethylhexyl) phthalate	NE	NE	6,670	35,000	1/1	160 J	NA	NA	0	0	180,000
Butyl benzyl phthalate	NE	NE	27,800	12,000,000	1/1	43 J	NA	NA	0	0	100,000,000
Chrysene	NE	NE	39,800	62,000	}/1	260 J	NA	NA	0	0	290,000
Dibenz(a,h)anthracene	NE	NE	168	62.0	1/1	75 J	NA	NA	0		290
Fluoranthene	NE NE	NE	276,080	2,300,000	1/1	640	NA	NA	0	0	30,000,000
Indeno(1,2,3-cd)pyrene	NE	NE	3,260	620	1/1	130 J	NA	NA	0	0	2,900
Naphthalene .	NE	NE	585	56,000	1/1	48 J	NA	NA	0	0	190,000
Phenanthrene	NE	NE	59,641	2,300,000	1/1	320 J	NA	NA	0	0	NE
Pyrene	NE	NE	286,440	2,300,000	1/1	380 J	NA .	NA	0	0	54,000,000
TOTAL METALS (mg/kg)				ĺ	Į		,				-
Chromium	2.1 - 37.7	9.3 - 27.3	27.2	210	1/1	4.9	0	0	0	0	450
Lead	1.5 - 15.2	4.8 - 13.7	270	400	1/1	5.7	0	0	0	0	750

Notes:

NA - Not Applicable NE - Not Established (1) Background concentrations were collected for inorganics

AOC comparison - AOC 2 Subsurface Soil Base comparison - Clay Subsurface Soil

J - Analyte present - Reported value is estimated

(2) Detected concentrations exceed NC DENR generic soil-to-groundwater criteria. Therefore, site-specific criteria were calculated using a TOC of 10,760 mg/kg.

APPENDIX H.3 BUILDING SM173 SITE WASTE MANAGEMENT UNIT 314 (BAKER, NOVEMBER 2001)

4.43 SWMU 314 - SM187 Oil/Water Separator

The following sections present the SWMU description and history, the investigation activities conducted during the Confirmatory Investigation, investigation findings, and recommendations.

4.43.1 SWMU Description and History

SWMU 314 consists of a newly constructed concrete oil/water separator and vehicle wash rack located south/southwest of Montford Landing Road and west/southwest (approximately 300 feet) of Northeast Creek at Camp Johnson. No evidence of stains, spills, or releases were noted during the site visit conducted by Baker in October 1996. Water from the vehicle wash rack is transported to the oil/water separator via underground pipelines. A SWMU investigation plan is presented as Figure 1.

4.43.2 Confirmatory Investigation Activities

The Confirmatory Investigation was conducted on September 9, 1997. The purpose of the investigation was to determine if operation of the oil/water separator has impacted surface and subsurface soils in the vicinity of the SWMU. The field procedures were performed in accordance with the Project Plans (Baker, 1997).

Four soil borings (SWMU 314-IS01 through SWMU 314-IS04) were advanced around the perimeter of the SWMU (see Figure 1). Groundwater was encountered in the borings at approximately 6 feet bgs. Two soil samples were collected from each boring at depths of 0 to 2 feet bgs and 4 to 6 feet bgs.

The samples were submitted to Quanterra Laboratories and analyzed for VOCs (EPA Methods 8020 and 8260), SVOCs (EPA Method 8270), and RCRA metals (EPA Method SW846 6010/7410). The analytical results for the soil samples are presented in Appendix D.

4.43.3 Investigation Findings

The laboratory analytical results for positive detections are summarized in Tables 1 and 2, and were compared to the following screening criteria (Table 3 and 4):

- AOC background values
- Base background values
- NC DENR soil to groundwater values
- USEPA Region IX residential soil PRGs

Figure 1 presents the distribution of contaminants that exceed the applicable screening criteria.

Five VOCs were detected in the sample set. None of the VOCs exceeded the applicable screening criteria.

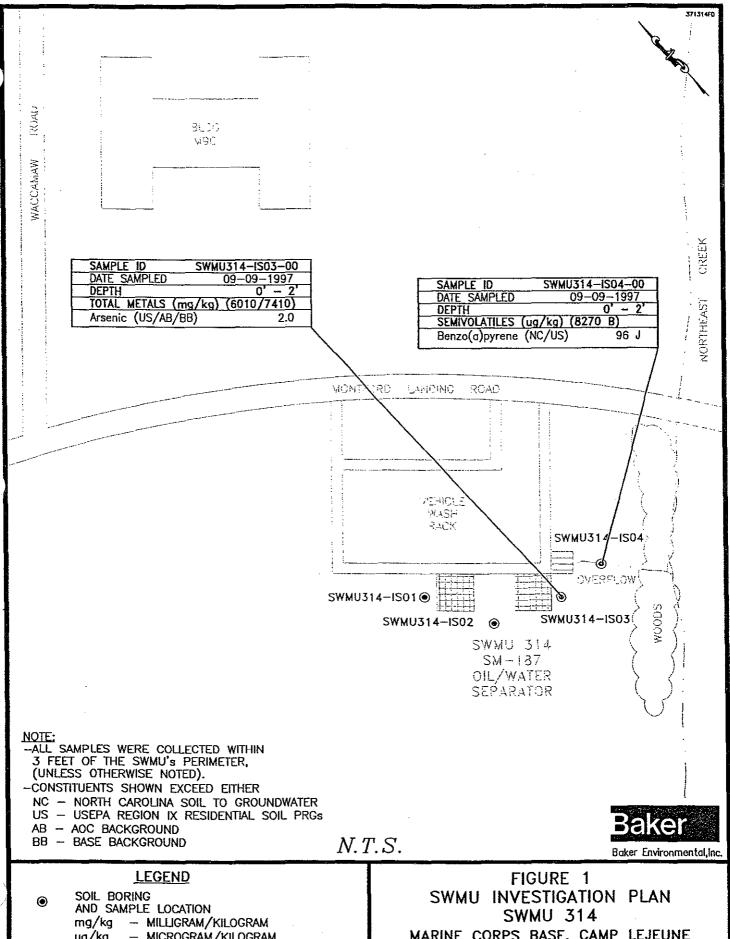
Eight SVOCs (mostly PAHs) were detected in the sample set. Benzo (a) pyrene exceeded both NC DENR soil to groundwater values and USEPA Region IX residential soil PRGs in surface soil sample SWMU 314-IS04-00. None of the other SVOCs exceeded the applicable screening criteria.

Cadmium, chromium, and lead exceeded the AOC and/or Base background screening criteria in one or more of the samples; however, the concentrations were below the NC DENR soil to groundwater values and USEPA Region IX residential soil PRGs. Arsenic exceeded AOC background, Base background and USEPA Region IX residential soil PRGs in surface soil sample SWMU 314-IS03-00.

Mercury exceeded the AOC background and NC DENR soil to groundwater screening criteria in surface soil samples SWMU 314-IS02-00 and IS04-00, but did not exceed Base background.

4.43.4 Conclusions

Based on evaluation of the analytical results, Benzo (a) pyrene exceeded both NC DENR soil to groundwater values and USEPA Region IX residential soil PRGs and arsenic exceeded AOC background, Base background and USEPA Region IX residential soil PRGs in surface soils. Therefore, additional investigation at SWMU 314 is warranted. The additional investigation activities are presented in Section 5.0.



ug/kg - MICROGRAM/KILOGRAM MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA

TABLE 1

DETECTION SUMMARY SURFACE SOIL - SWMU 314 SWMU CONFIRMATORY SAMPLING (CTO-0371) MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID DATE SAMPLED	SWMU314-IS01-00 09-09-1997	SWMU314-1S02-00 09-09-1997	SWMU314-IS03-00 09-09-1997	SWMU314-IS04-00 09-09-1997
DEPTH	0' - 2'	0' - 2'	0' - 2'	0' - 2'
VOLATILES (ug/kg)			,	
Tetrachloroethene	5.7 U	1.9 J	5.4 U	5.8 U
Trichloroethene	5.7 U	2.2 J	1.7 J	2.1 J
1,3-Dichlorobenzene	1.1 U	4.5	7.3	7.3
SEMIVOLATILES (ug/kg)	1.1 0	110	71.0	7.0
Benzo(a)anthracene	1900 U	350 U	350 U	69 J
Benzo(a)pyrene	1900 U	350 U	350 U	<u>96</u> J
Benzo(b)fluoranthene	1900 U	350 U	350 U	130 J
bis(2-Ethylhexyl) phthalate	640 J	170 J	130 J	120 J
Butyl benzyl phthalate	7000	370	350 U	380 U
Chrysene	1900 U	350 U	350 U	73 J
Fluoranthene	1900 U	350 U	350 U	74 J
Pyrene	1900 U	350 U	350 U	110 J
TOTAL METALS (mg/kg)				
Arsenic	1.1 U	1.1 U	2	1.2 U
Cadmium	1.3	2.2	0.54 U	0.67
Chromium	3.7	5.6	13.7	6
Lead	10.1	12.6	7.8	24.9
Mercury	0.038 U	0.058	0.035 U	0.038

Notes:

- Exceeds background concentrations

Bold - Exceeds NC DENR soil to groundwater comparison criteria

<u>Underlined</u> - Exceeds USEPA Region IX Residential PRGs

U - Not detected

J - Analyte present - Reported value is estimated

TABLE 2

DETECTION SUMMARY SUBSURFACE SOIL - SWMU 314 SWMU CONFIRMATORY SAMPLING (CTO-0371) MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID DATE SAMPLED DEPTH	SWMU314-IS01-02 09-09-1997 4' - 6'	SWMU314-IS02-02 09-09-1997 4' - 6'	SWMU314-IS03-02 09-09-1997 4' - 6'	SWMU314-IS04-02 09-09-1997 4' - 6'
VOLATILES (ug/kg)				
Acetone	23 U	27	42	14 J.
Tetrachloroethene	5.8 U	3 J	6.1 U	6.1 U
Trichloroethene	2.5 J	3.7 J	6.1 U	6.1 U
1,3-Dichlorobenzene	6	5.3	1.2 U	1.2 U
1,4-Dichlorobenzene	1.8	1.2 U	1.2 U	1,2 U
SEMIVOLATILES (ug/kg)				
bis(2-Ethylhexyl) phthalate	1600 J	22 0 J	74 J	350 J
TOTAL METALS (mg/kg)				
Arsenic	1.2 U	1.2 U	1.3	1.9
Cadmium	0.74	0.58 U	0.61 U	1.2
Chromium	5.4	6.8	11.1	9.5
Lead	19.2	80.6	6.4	38.9

Notes:

- Exceeds background concentrations

Bold - Exceeds NC DENR soil to groundwater comparison criteria

<u>Underlined</u> - Exceeds USEPA Region IX Residential PRGs

U - Not detected

J - Analyte present - Reported value is estimated

TABLE 3

SURFACE SOIL DATA AND STATISTICAL SUMMARY SWMU CONFIRMATORY SAMPLING CTO-371: SMWU 314

MCB, CAMP LEJEUNE JACKSONVILLE, NC

		Cor	nparison Criteria		Contaminant Fre	quency / Range	Nun	nber of Exceedence	s Above Comparison	Criteria	Comparison Criteria
	Backgr	ound ⁽¹⁾	NC DENR	USEPA Region IX	No. of Positive	Range	Positive Detects	Positive Detects	Positive Detects	Positive Detects	USEPA Region IX
Contaminant	AOC	Base	Soil to Groundwater	PRGs	Detects /	of Positive	Above AOC	Above Base	Above NC DENR	USEPA Region IX	PRGs
	Background	Background	Values	Residential Soil	No. of Samples	Detections	Background	Background	Soil to Groundwater	Residential Soil	Industrial Soil
VOLATILES (ug/kg)											
Tetrachloroethene	NE	NE	7	5,700	l/4	1,9 J	NA	NA NA	0	0	19,000
Trichloroethene	NE	NE	18	2,800	3/4	1.7 J - 2.2 J	NΛ	NA	0	0	6,100
1,3-Dichlorobenzene	NE	NE	23,700	13,000	3/4	4.5 - 7.3	NA	NA	0	0	52,000
SEMIVOLATILES (ug/kg)				- · ·							
Benzo(a)anthracene	NE	NE	358	620	1/4	69 J	NA	NA	0	0	2,900
Benzo(a)pyrene	NE	NE	91	62	1/4	96 J	NA	- NA		1 1	290
Benzo(b)fluoranthene	NE	NE	2,257	620	1/4	130 J	NA	NA	0	0	2,900
bis(2-Ethylhexyl) phthalate	NE	NE	6,670	35,000	4/4	120 J - 640 J	NA	NA	Ö	0	180,000
Butyl benzyl phthalate	NE	NE	27,800	12,000,000	2/4	370 - 7000	NA	NA	0	0	100,000,000
Chrysene	NE	NE	39,800	62,000	1/4	73 J	NA	NA	0	0	290,000
Fluoranthene	NE	NE	276,080	2,300,000	1/4	74 J	NA NA	NA	0	0	30,000,000
Pyrene	NE NE	NE	286,440	2,300,000	1/4	110 J	NA	NA	0	0	54,000,000
TOTAL METALS (mg/kg)							West to her of the transfer double to the transfer			manus de la contraction de la	
Arsenic	0.3 - 1.19	0.27 - 0.67	26.2	0.39	1/4	2	學與新聞的問題			EDMENSON AND	2,7
Cadmium		0.037 - 0.038	2.7	37	3/4	0.67 - 2.2	证例663期间	granges 3 miles (Se	0	0	810
Chromium	1.3 - 6.19	0.24 - 15.2	27.2	210	4/4	3.7 - 13.7	ar as one last more	0	0	0	450
Lead	2.4 - 11.9	0.45 - 20.9	270	400	4/4	7.8 - 24.9	中型数2数数数		0	0	750
Mercury	0.021 - 0.044	0.020 - 0.10	0.0154	23	2/4	0.038 - 0.058	2008年101日開始	0	2 2 1	0	610

Notes:

NA - Not Applicable NE - Not Established J - Analyte present - Reported value is estimated

(1) Background concentrations were collected for inorganics

AOC comparison - AOC 3 Surface Soil Base comparison - Fine Sand Surface Soil

TABLE 4

SUBSURFACE SOIL DATA AND STATISTICAL SUMMARY SWMU CONFIRMATORY SAMPLING CTO-371: SMWU 314 MCB, CAMP LEJEUNE JACKSONVILLE, NC

		Comparison Criteria				quency / Range	Nun	nber of Exceedence	s Above Comparison	Criteria	Comparison Criteria
	Backgi	round ⁽¹⁾	NC DENR	USEPA Region IX	No. of Positive	Range	Positive Detects	Positive Detects	Positive Detects	Positive Detects	USEPA Region IX
Contaminant	AOC	Base	Soil to Groundwater	PRGs	Detects /	of Positive	Above AOC	Above Base	Above NC DENR	USEPA Region IX	PRGs
	Background	Background	Values	Residential Soil	No. of Samples	Detections	Background	Background	Soil to Ground water	Residential Soil	Industrial Soil
VOLATILES (ug/kg)	·										
Acetone	NE	NE	2,810	1,600,000	3/4	14 J - 42	NA	NA .	0	U	6,200,000
Tetrachloroethene	NE	NE	7	5,700	1/4	3 J	NA	NA	Ō	0	19,000
Trichloroethene	NE	NE	18	2,800	2/4	2.5 J - 3.7 J	NA	NA	0	0	6,100
1,3-Dichlorobenzene	NE	NE	23,700	13,000	2/4	5.3 - 6	NA	NA	0	0	52,000
1,4-Dichlorobenzene	NE	NE	1,240	3,400	1/4	1.8	NA	NΛ	Ö	0	8,100
SEMIVOLATILES (ug/kg)											
bis(2-Ethylhexyl) phthalate	NE	NE	6,670	35,000	4/4	74 J - 1600 J	NA	NA	0	0	180,000
TOTAL METALS (mg/kg)											
Arsenic	0.46 - 3.47	0.43 - 11.4	26.2	0.39	2/4	1.3 - 1.9	0	0	0	1.001772	2.7
Cadmium	NE	NE	2.7	37	2/4	0.74 - 1.2	NA	NA	0	0	810
Chromium	l - 19,5	9,3 - 27,3	27.2	210	4/4	5.4 - 11.1	0	0	0	0	450
Lead	1.3 - 20.7	4.8 - 13.7	270	400	4/4	6.4 - 80,6	2. (4.1)	6 (2 (d) (d)	0	0	750

Notes:

NA - Not Applicable NE - Not Established J - Analyte present - Reported value is estimated

(1) Background concentrations were collected for inorganics AOC comparison - AOC 3 Subsurface Soil Base comparison - Clay Subsurface Soil

0/5/0

SWMU 314 ORGANIC COMPOUNDS SWMU CONFIRMATORY SAMPLING (CTO-0371)

SM187 - O/V, MARINE CAORPS SUPPORTED SERVICES SCHOOL GROUP MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU314-IS01-00	SWMU314-IS01-02	SWMU314-IS02-00	SWMU314-IS02-02	SWMU314-IS03-00	SWMU314-IS03-02
LAB ID	H7I110131071	H7I110131072	H7I110131073	H7I110131074	H7I110131075	H71110131076
DATE SAMPLED	09-09-1997	09-09-1997	09-09-1997	09-09-1997	09-09-1997	09-09-1997
DEPTH	0' - 2'	4' - 6'	0' - 2'	4' - 6'	0' - 2'	4' - 6'
VOLATILES (ug/kg) (8260A)						
1,1,1-Trichloroethane	5.7 U	5,8 U	5,4 U	5.8 U	5,4 U	6.1 U
1,1,2,2-Tetrachloroethane	5.7 U	5.8 U	5.4 U	5.8 U	5,4 U	6.1 U
1,1,2-Trichloroethane	5.7 U	5.8 U	5.4 U	5,8 U	5.4 U	6.1 U
1,1-Dichloroethane	5.7 U	5.8 U	5.4 U	5.8 U	5,4 U	6.1 U
1,1-Dichloroethene	5.7 U	5.8 U	5.4 U	5.8 U	5.4 U	6.1 U
1,2-Dichloroethane	5.7 U	5.8 U	5.4 U	5.8 U	5,4 U	6.1 U
1,2-Dichloroethene (total)	5.7 U	5.8 U	5.4 U	5.8 U	5.4 U	6.1 U
1,2-Dichloropropane	5.7 U	5.8 U	. 5.4 U	5.8 U	5.4 U	6.1 U
2-Butanone	23 U	23 U	21 U	23 U	21 U	24 U
2-Hexanone	23 U	23 U	21 U	23 U	21 U	24 U
4-Methyl-2-pentanone	23 U	23 U	21 U	23 U	21 U	24 U
Acetone	23 U	23 U	21 U	27	21 U	. 42
Benzene	5.7 U	5.8 U	5.4 U	5.8 U	5.4 U	6.1 U
Bromodichloromethane	5.7 U	5.8 U	5.4 U	. 5.8 U	5.4 U	6.1 U
Bromoform	5.7 U	5.8 U	5,4 U	5.8 U	5.4 U	6.1 U
Bromomethane	11 U	12 U	11 U	12 U	11 U ·	12 U
Carbon disulfide	5.7 U	5.8 U	5.4 U	5.8 U	5.4 U	6.1 U
Carbon tetrachloride	5.7 U	5.8 U	5,4 U	5.8 U	5.4 U	6.1 U
Chlorobenzene	5.7 U	5.8 U	5.4 U	5.8 U	5,4 U	6.1 U
Chloroethane	11 U	12 U	11 U	12 U	11 U	12 U
Chloroform	5.7 U	5.8 U	5,4 U	5.8 U	5.4 U	6.1 U
Chloromethane	11 U	12 U	11 U	12 U	11 U	12 U
cis-1,3-Dichloropropene	5.7 U	5.8 U	5.4 U	5.8 U	5.4 U	6.1 U
Dibromochloromethane	5.7 U	5.8 U	5.4 U	5.8 U	5,4 U	6.1 U
Ethylbenzene	5.7 U	5.8 U	5.4 U	5.8 U	5,4 U	6.1 U
Methylene chloride	5.7 U	5.8 U	5.4 U	5.8 U	5,4 U	6.1 U
Styrene	5.7 U	5.8 U	5.4 U	5.8 U	5,4 U	1.6 U
Tetrachloroethene	5.7 U	5.8 U	1.9 J	3 Ј	5.4 U	6.1 U
Toluene	5.7 U	5.8 U	5.4 U	5.8 U	5.4 U	6.1 U
trans-1,3-Dichloropropene	5,7 U	5.8 U	5.4 U	5.8 U	5.4 U	6.1 U
Trichloroethene	5.7 U	2.5 J	2.2 J	3.7 J	1.7 J	6.1 U
Vinyl chloride	11 U	12 U	11 U	12 U	11 U	12 U
Xylenes (total)	5.7 U	5.8 U	5.4 U	5.8 U	5.4 U	. 6.1 U

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SWM 1

ORGANIC C DUNDS

SWMU CONFIRMATOR: APLING (CTO-0371) SM187 - O/W, MARINE CAORPS SUPPORTED SERVICES SCHOOL GROUP MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID LAB ID DATE SAMPLED DEPTH	SWMU314-IS01-00 II7I110131071 09-09-1997 0' - 2'	SWMU314-IS01-02 H7I110131072 09-09-1997 4' • 6'	SWMU314-IS02-00 H7I110131073 09-09-1997 0' - 2'	SWMU314-IS02-02 H7I110131074 09-09-1997 4' - 6'	SWMU314-IS03-00 H7I110131075 09-09-1997 0' - 2'	SWMU314-IS03-02 H71110131076 09-09-1997 4' - 6'
VOLATILES (ug/kg) (8020)						
1,2-Dichlorobenzene	1.1 U	1.2 U	1.1 U	1.2 U	1,1 U	1,2 U
1,3-Dichlorobenzene	1.1 U	6	4.5	5,3	7.3	1.2 U
1,4-Dichlorobenzene	1.1 U	1.8	1,1 U	1.2 U	1.1 U	1.2 U
Benzene	1.1 U	1.2 U	1,1 U	1.2 U	1.1 U	1.2 U
Chlorobenzene	1.1 U	1.2 U	1.1 U	1.2 U	1.1 U	1.2 U
Ethylbenzene	1.1 U	1.2 U	1.1 U	1.2 U	1.1 U	1.2 U
Toluene	1.1 U	1.2 U	1.1 U	1.2 U	1.1 U	1.2 U
Xylenes (total)	1.1 U	1.2 U	1.1 U	1.2 U	1,1 U	1.2 U

SWMU 314 ORGANIC COMPOUNDS SWMU CONFIRMATORY SAMPLING (CTO-0371) SM187 - O/W, MARINE CAORPS SUPPORTED SERVICES SCHOOL GROUP MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU314-IS01-00	SWMU314-IS01-02	SWMU314-IS02-00	SWMU314-IS02-02	SWMU314-IS03-00	SWMU314-1803-02
LAB ID	H7II10131071	H7[110131072	H7I110131073	H7I110131074	H7I110131075	H71110131076
DATE SAMPLED	09-09-1997	09-09-1997	09-09-1997	09-09-1997	09-09-1997	09-09-1997
DEPTH	0' - 2'	4' - 6'	0' - 2'	4' - 6'	0' - 2'	4' - 6'
SEMIVOLATILES (ug/kg) (8270)						
1,2,4-Trichlorobenzene	1900 U	380 U	350 U	380 U	350 U	400 U
1,2-Dichlorobenzene	1900 U	380 U	350 U	380 U	350 U	400 U
1,3-Dichlorobenzene	1900 U	380 U	350 U	380 U	350 U	400 U
1,4-Dichlorobenzene	1900 U	380 U	350 U	380 U	350 U	400 U
2,2'-Oxybis(1-Chloropropane)	1900 U	380 U	350 U	380 U	350 U	400 U
2,4,5-Trichlorophenol	1900 U	380 U	350 U	380 U	350 U	400 U
2,4,6-Trichlorophenol	1900 U	380 U	350 U	380 U	350 U	400 U
2,4-Dichlorophenol	1900 U	380 U	350 U	380 U	350 U	400 U
2,4-Dimethylphenol	1900 U	380 U	350 U	380 U	350° U	400 U
2,4-Dinitrophenol	9100 U	1900 U	1700 U	1800 U	1700 U	1900 U
2,4-Dinitrotoluene	1900 U	380 U	350 U	380 U	350 U	400 U
2,6-Dinitrotoluene	1900 U	380 U	350 U	380 U	350 U	400 U
2-Chloronaphthalene	1900 U	380 U	350 U	380 U	350 U	400 U
2-Chlorophenol	1900 U	380 U	350 U	380 U	350 U	400 U
2-Methylnaphthalene	1900 U	380 U	350 U	380 U	350 U	400 U
2-Methylphenol	1900 U	380 U	350 U	380 U	350 U	400 U
2-Nitroaniline	9100 U	1900 U	1700 U	1800 U	1700 U	1900 U
2-Nitrophenol	1900 U	380 U	350 U	380 U	350 U	400 U
3,3'-Dichlorobenzidine	9100 U	1900 U	1700 U	1800 U	1700 U	1900 U
3-Nitroaniline	9100 U	1900 U	1700 U	1800 U	1700 U	1900 U
4,6-Dinitro-2-methylphenol	9100 U	1900 U	1700 U	1800 U	1700 U	1900 U
4-Bromophenyl phenyl ether	1900 U	380 U	350 U	380 U	350 U	400 U
4-Chloro-3-methylphenol	1900 U	380 U	350 U	380 U	350 U	400 U
4-Chloroaniline	1900 U	380 U	350 U	380 U	350 U	400 U
4-Chlorophenyl phenyl ether	1900 U	380 U	350 U	380 U	350 U	400 U
4-Methylphenol	1900 U	380 U	350 U	380 U	350 U	400 U
4-Nitroaniline	9100 U	1900 U	1700 U	1800 U	1700 U	1900 U
4-Nitrophenol	9100 U	1900 U	1700 U	1800 U	1700 U	1900 U
Acenaphthene	1900 U	380 U	350 U	380 U	350 U	400 U
Acenaphthylene	1900 U	380 U	350 U	380 U	350 U	400 U
Anthracene	1900 U	380 U	350 U	380 U	350 U	400 U
Benzo(a)antluacene	1900 U	380 U	350 U	380 U	350 U	400 U
Benzo(a)pyrene	1900 U	380 U	350 U	380 U	350 U	400 U
Benzo(b)fluoranthene	1900 U	380 U	350 U	380 U	350 U	400 U

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swM

ORGANIC C OUNDS

SWMU CONFIRMATOR. APLING (CTO-0371) SM187 - O/W, MARINE CAORPS SUPPORTED SERVICES SCHOOL GROUP MCB, CAMP LEJEUNE, NORTH CAROLINA

		•				
SAMPLE ID	SWMU314-IS01-00	SWMU314-IS01-02	SWMU314-IS02-00	SWMU314-IS02-02	SWMU314-IS03-00	SWMU314-IS03-02
LAB ID	H7I110131071	H7I110131072	H7I110131073	H7I110131074	H7I110131075	H7I110131076
DATE SAMPLED	09-09-1997	09-09-1997	09-09-1997	09-09-1997	09-09-1997	09-09-1997
DEPTH	0' - 2'	4' • 6'	0' - 2'	4' - 6'	0' - 2'	4' - 6'
SEMIVOLATILES (ug/kg) (8270) (conf)					
Benzo(ghi)perylene	1900 U	380 U	350 U	380 U	350 U	400 U
Benzo(k)fluoranthene	1900 U	380 U	350 U	380 U	350 U	400 U
bis(2-Chloroethoxy)methane	1900 U	380 U	350 U	380 U	350 U	400 U
bis(2-Chloroethyl) ether	1900 U	380 U	350 U	380 U	350 U	400 U
bis(2-Ethylhexyl) phthalate	640 J	1600 J	170 J	220 J	130 J	74 J
Butyl benzyl phthalate	7000	380 U	370	380 U	350 U	400 U
Carbazole	1900 U	380 U	350 U	380 U	350 U	400 U
Chrysene	1900 U	380 U	350 U	380 U	350 U	400 U
Dibenz(a,h)anthracene	1900 U	380 U	350 U	380 U	350 U	400 U
Dibenzofuran	1900 U	380 U	350 U	380 U	350 U	400 U
Diethyl phthalate	1900 U	380 U	350 U	380 U	350 U	400 U
Dimethyl phthalate	1900 U	380 U	350 U	380 U	350 U	400 U
Di-n-butyl phthalate	1900 U	380 U	350 U	380 U	350 U	400 U
Di-n-octyl phthalate	1900 U	380 U	350 U	380 U	350 U	400 U
Fluoranthene	1900 U	380 U	350 U	380 U	350 U	400 U
Fluorene	1900 U	380 U	350 U	380 U	350 U	400 U
Hexachlorobenzene	1900 U	380 U	350 U	380 U	350 U	400 U
Hexachlorobutadiene	1900 U	380 U	350 U	380 U	350 U	400 U
Hexachlorocyclopentadiene	9100 U	1900 U	1700 U	1800 U	1700 U	1900 U
Hexachloroethane	1900 U	380 U	350 U	380 U	350 U	400 U
Indeno(1,2,3-cd)pyrene	1900 U	380 U	350 U	380 U	350 U	400 U
Isophorone	1900 U	380 U	350 U	380 U	3 5 0 U	400 U
Naphthalene	1900 U	380 U	350 U	380 U	350 U	400 U
Nitrobenzene	1900 U	380 U	350 U	380 U	350 U	400 U
N-Nitrosodi-n-propylamine	1900 U	380 U	350 U	380 U	350 U	400 U
N-Nitrosodiphenylamine	1900 U	380 U	350 U .	380 U	350 U	400 U
Pentachlorophenol	9100 U	1900 U	1700 U	1800 U	1700 U	1900 U
Phenanthrene	1900 U	380 U	350 U	380 U	350 U	400 U
Phenol	1900 U	380 U	350 U	380 U	350 U	400 U
Pyrene	1900 U	380 U	350 U	380 U	350 U	400 U

SWMU 314

ORGANIC COMPOUNDS

SWMU CONFIRMATORY SAMPLING (CTO-0371)

SM187 - O/W, MARINE CAORPS SUPPORTED SERVICES SCHOOL GROUP MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU314-IS04-00	SWMU314-IS04-02
LAB ID	H7H10131077	H7I110131078
DATE SAMPLED	09-09-1997	09-09-1997
DEPTH	0' - 2'	4' - 6'
VOLATILES (ug/kg) (8260A)		
1,1,1-Trichloroethane	5.8 U	6.1 U
1,1,2,2-Tetrachloroethane	5.8 U	6.1 U
1,1,2-Trichloroethane	5.8 U	6.1 U
1,1-Dichloroethane	5.8 U	6.1 U
1,1-Dichloroethene	5.8 U	6.1 U
1,2-Dichloroethane	5.8 U	6.1 U
1,2-Dichloroethene (total)	5.8 U	6,1 U
1,2-Dichloropropane	5.8 U	6.1 U
2-Butanone	23 U	24 U
2-Hexanone	23 U	24 U
4-Methyl-2-pentanone	23 U	24 U
Acetone	23 U	14 J
Benzene	5.8 U	6.1 U
Bromodichloromethane	5.8 U	6.1 U
Bromoform	5.8 U	6.1 U
Bromomethane	12 U	12 U
Carbon disulfide	5.8 U	U 1,6
Carbon tetrachloride	5.8 U	6.1 U
Chlorobenzene	5.8 U	6.1 U
Chloroethane	12 U	12 U
Chloroform	5.8 U	6.1 U
Chloromethane	12 U	12 U
cis-1,3-Dichloropropene	5.8 U	6.1 U
Dibromochloromethane	5.8 U	6.1 U
Ethylbenzene	5.8 U	6.1 U
Methylene chloride	5.8 U	6.1 U
Styrene	5.8 U	6.1 U
Tetrachloroethene	5.8 U	6.1 U
Toluene	5.8 U	6.1 U
trans-1,3-Dichloropropene	5.8 U	6,1 U
Trichloroethene	2.1 J	6.1 U
Vinyl chloride	12 U	12 U
Xylenes (total)	5.8 U	6.1 U
22 Tollan (tolal)	2,0 0	3,1 0

SWM

ORGANIC C

OUNDS

SWMU CONFIRMATOR'\ ...APLING (CTO-0371) SM187 - O/W, MARINE CAORPS SUPPORTED SERVICES SCHOOL GROUP MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU314-IS04-00	SWMU314-IS04-02
LAB ID	H7I110131077	H71110131078
DATE SAMPLED	09-09-1997	09-09-1997
DEPTH	0' - 2'	4' - 6'
VOLATILES (ug/kg) (8020)		
1,2-Dichlorobenzene	1.2 U	1.2 U
1,3-Dichlorobenzene	7.3	1.2 U
I,4-Dichlorobenzene	1.2 U	1.2 U
Benzene	1.2 U	1.2 U
Chlorobenzene	1.2 U	1.2 U
Ethylbenzene	1.2 U	1.2 U
Toluene	1.2 U	1.2 U
Xylenes (total)	1.2 U	1.2 U

SWMU 314

ORGANIC COMPOUNDS

SWMU CONFIRMATORY SAMPLING (CTO-0371) SM187 - O/V, MARINE CAORPS SUPPORTED SERVICES SCHOOL GROUP MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	SWMU314-IS04-00	SWMU314-IS04-02
LAB ID	H7I110131077	H7I110131078
DATE SAMPLED	09-09-1997	09-09-1997
DEPTH	0' - 2'	4' - 6'
SEMIVOLATILES (ug/kg) (8270)		
1,2,4-Trichlorobenzene	380 U	400 U
1,2-Dichlorobenzene	380 U	400 U
1,3-Dichlorobenzene	380 U	400 U
1,4-Dichlorobenzene	380 U	400 U
2,2'-Oxybis(1-Chloropropane)	380 U	400 U
2,4,5-Trichlorophenol	380 U	400 U
2,4,6-Trichlorophenol	380 U	400 U
2,4-Dichlorophenol	380 U	400 U
2,4-Dimethylphenol	380 U	400 U
2,4-Dinitrophenol	1800 U	1900 U
2,4-Dinitrotoluene	380 U	400 U
2,6-Dinitrotoluene	380 U	400 U
2-Chloronaphthalene	380 U	400 U
2-Chlorophenol	380 U	400 U
2-Methylnaphthalene	380 U	400 U
2-Methylphenol	380 U	400 U
2-Nitroaniline	1800 U	1900 U
2-Nitrophenol	380 U	400 U
3,3'-Dichlorobenzidine	1800 U	1900 U
3-Nitroaniline	1800 U	1900 U
4,6-Dinitro-2-methylphenol	1800 U	1900 U
4-Bromophenyl phenyl ether	380 U	400 U
4-Chloro-3-methylphenol	380 U	400 U
4-Chloroaniline	380 U	400 U
4-Chlorophenyl phenyl ether	380 U	400 U
4-Methylphenol	380 U	400 U
4-Nitroaniline	1800 U	1900 U
4-Nitrophenol	1800 U	1900 U
Acenaphthene	380 U	400 U
Acenaphthylene	380 U	400 U
Anthracene	380 U	400 U
Benzo(a)anthracene	69 J	400 U
Benzo(a)pyrene	96 J	400 U
Benzo(b)fluoranthene	130 J	400 U
411 1 1/5/00		

SWM'

ORGANIC CO UNDS

SAMPLE ID	SWMU314-IS04-00	SWMU314-IS04-02
LABID	H7I110131077	H7I110131078
DATE SAMPLED	09-09-1997	09-09-1997
DEPTH	0' - 2'	4' - 6'
SEMIVOLATILES (ug/kg) (8270) (cont)		
Benzo(ghi)perylene	380 U	400 U
Benzo(k)fluoranthene	380 U	400 U
bis(2-Chloroethoxy)methane	380 U	400 U
bis(2-Chloroethyl) ether	380 U	400 U
bis(2-Ethylhexyl) phthalate	120 J .	350 J
Butyl benzyl phthalate	380 U	400 U
Carbazole	380 U	400 U
Chrysene	73 J	400 U
Dibenz(a,h)anthracene	380 U	400 U
Dibenzofuran	380 U	400 U
Diethyl phthalate	380 U	400 U
Dimethyl phthalate	380 U	400 U
Di-n-butyl phthalate	380 U	400 U
Di-n-octyl phthalate	380 U	400 U
Fluoranthene	74 J	400 U
Fluorenc	380 U	400 U
Hexachlorobenzene	380 U	400 U
Hexachlorobutadiene	380 U	400 U
Hexachlorocyclopentadiene	1800 U	1900 U
Hexachloroethane	380 U	400 U
Indeno(1,2,3-cd)pyrene	380 U	400 U
Isophorone	380 U	400 U
Naphthalene	380 U	400 U
Nitrobenzene	380 U	400 U
N-Nitrosodi-n-propylamine	380 U	400 U
N-Nitrosodiphenylamine	380 U	400 U
Pentachlorophenol	1800 U	1900 U
Phenanthrene	380 U	400 U
Phenol	380 U	400 U
Pyrene	110 J	400 U

SWMU 314 TOTAL INORGANICS

SWMU CONFIRMATORY SAMPLING (CTO-0371) SM187 - O/W, MARINE CAORPS SUPPORTED SERVICES SCHOOL GROUP MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID LAB ID DATE SAMPLED DEPTH	SWMU314-IS01-00 H7I110131071 09-09-1997 0' - 2'	SWMU314-IS01-02 H7I110131072 09-09-1997 4' - 6'	SWMU314-IS02-00 H7II10131073 09-09-1997 0' - 2'	SWMU314-IS02-02 H7I110131074 09-09-1997 4' • 6'	SWMU314-IS03-00 H7I110131075 09-09-1997 0' - 2'	SWMU314-IS03-02 H7I110131076 09-09-1997 4' - 6'
TOTAL METALS (mg/kg) (6010/7410)						
Arsenic	1.1 U	1.2 U	1.1 U	1.2 U	2	1.3
Barium	22.7 U	23.1 U	21.5 U	23.1 U	21.4 U	24.3 U
Cadmium	1.3	0.74	2.2	0.58 U	0.54 U	0.61 U
Chromium	3.7	5.4	5.6	6.8	13.7	11.1
Lead	10.1	19.2	12.6	80.6	7.8	6.4
Mercury	0.038 U	0.038 U	.0.058	0.038 U	0.035 U	0.04 U
Selenium	0.57 U	0.58 U	0.54 U	0.58 U	0.54 U	0.61 U
Silver	1.1 U	1.2 U	1.1 U	1.2 U	1.1 U	1.2 U

SWMU

TOTAL INORGANICS

SWMU CONFIRMATORY SAMPLING (CTO-0371) SM187 - O/W, MARINE CAORPS SUPPORTED SERVICES SCHOOL GROUP MCB, CAMP LEJEUNE, NORTH CAROLINA

SWMU314-IS04-00	SWMU314-IS04-02
H7I110131077	H7H10131078
09-09-1997	09-09-1997
0' - 2'	4' - 6'
1.2 U	1.9
23.1 U	24.2 U
0.67	1.2
6	9.5
24.9	38.9
0.038	0.04 ป
0.58 U	0.61 U
1.2 U	1.2 U
	H71110131077 09-09-1997 0'-2' 1.2 U 23.1 U 0.67 6 24.9 0.038 0.58 U

APPENDIX I PRELIMINARY ASSESSMENT FIELD INVESTIGATION CHECKLISTS (FIELD RECONNAISSANCE)



Baker Environmental, Inc.

A Unit of Michael Baker Corporation

Airport Office Park, Building 3 420 Rouser Road Coraopolis. Pennsylvania 15108

(412) 269-6000 FAX (412) 269-2002

February 26, 2002

Commanding General ACS-EMD, Building 58 PSC Box 20004 Marine Corps Base Camp Lejeune, NC 28542-0004

Attn: Mr. Thomas Burton

Environmental Engineer

Re:

Contract N62470-95-D-6007 Navy CLEAN II, District III Contract Task Order (CTO) 0190

Preliminary Assessment (PA) Field Inspection Checklists

PA Sites HP902, HP908, HP1120, HP1124, HP1409, HP1512, M119,

SM173, TC830, SAS113, AS116 and AS119

Marine Corps Base, Camp Lejeune, North Carolina

Dear Mr. Burton:

Attached are the PA Field Inspection Checklists for your field reconnaissance of the twelve PA sites at Marine Corps Base (MCB) Camp Lejeune. For quick and easy referencing, the checklists are categorized by the area where the site is located at the Base (Hadnot Point, Airside, and Montford Point), and subcategorized by building number. Included in the package are figures that locate the sites on the Base, which are separated by respective building numbers.

Some of the questions on the checklist have already been answered by using the Historical Literature Search performed by Jim Dolph (Navy Historian). The remaining questions that will be answered through your field reconnaissance have been marked with an asterisk (*). It is important to note that the PA Field Inspection Checklist was created to fulfill the requirements of the PA – Score Sheet for scoring purposes. Not all questions/answers will apply to this particular project, in these instances the questions have been crossed out.

In addition to completing the PA Field Inspection Checklist, the following is a list of tasks to consider when performing the field reconnaissance:

- If wells are observed in the field and are not presented on the site figure, mark them on the figure with the proper well identifications.
- Pictures should be taken of the buildings/structures from all directions and noted on the Photo Log in the back of the PA Field Investigation Checklist package for each site.
- Any other obvious structures surrounding the sites should also be photographed (buildings, sheds, Above Ground Storage Tanks (ASTs), wash racks etc.) and written in the photo log.





Mr. Thomas Burton February 26, 2002 Page 2

- Any drainage ditches, sewers, or swales should also be photographed and discussed on the checklist form for each site. If possible, sketches should be drawn of these drainage areas.
- Pictures should also be taken of any distressed vegetation, colored soil, or obvious contamination.
- If possible, when touring a facility, pictures should be taken of operations and equipment inside the building and any drums or waste that may be stored there.
- If possible, locate any schools, daycare facilities, or residential areas in close proximity to the sites being studied.

The above mentioned information obtained during the field reconnaissance will be used to prepare the Final PA Report. Baker requests that the PA Field Inspection Checklists be sent to Baker along with the disposable cameras used for photographs no later than March 15, 2002 to ensure compilation into the PA Report.

Should you have any questions regarding this submittal, please contact me directly at 412-269-6124.

Sincerely,

BAKER ENVIRONMENTAL, INC.

Mina C. Mindt

Nina C. Mendt

Environmental Scientist

NCM/lp

cc:

Mr. Channing Blackwell, LANTDIV (letter only)

Mr. Matt Schulze, CH2M Hill (one copy)

SWMUS THAT ARE NEAR THE PA SITES MCB, CAMP LEJEUNE

1.0 HADNOT POINT INDUSTRIAL AREA

- 1.1 Building HP902
 - SWMW None
- 1.2 Building HP908
 - SWMU None
- 1.3 Building HP1120
 - SWMU None
- 1.4 Building HP1124
 - SWMU 292, 293 (1106/1107) Nearby
- 1.5 Building HP1409
 - SWMU None
- 1.6 Building HP1512
 - SWMU None

2.0 AIRSIDE

- 2.1 Building TC830
 - SWMU 307 and 316 North of Building TC830
- 2.2 Building SAS113
 - SWMU 299 and 300 Nearby
- 2.3 Building AS116
 - SWMU 299 and 300 Nearby
- 2.4 Building AS119
 - SWMU 299 and 300 Nearby

3.0 MONTFORD POINT

- 3.1 Building M119
 - SWMU 314 Nearby
- 3.2 Building SM173
 - SWMU 314

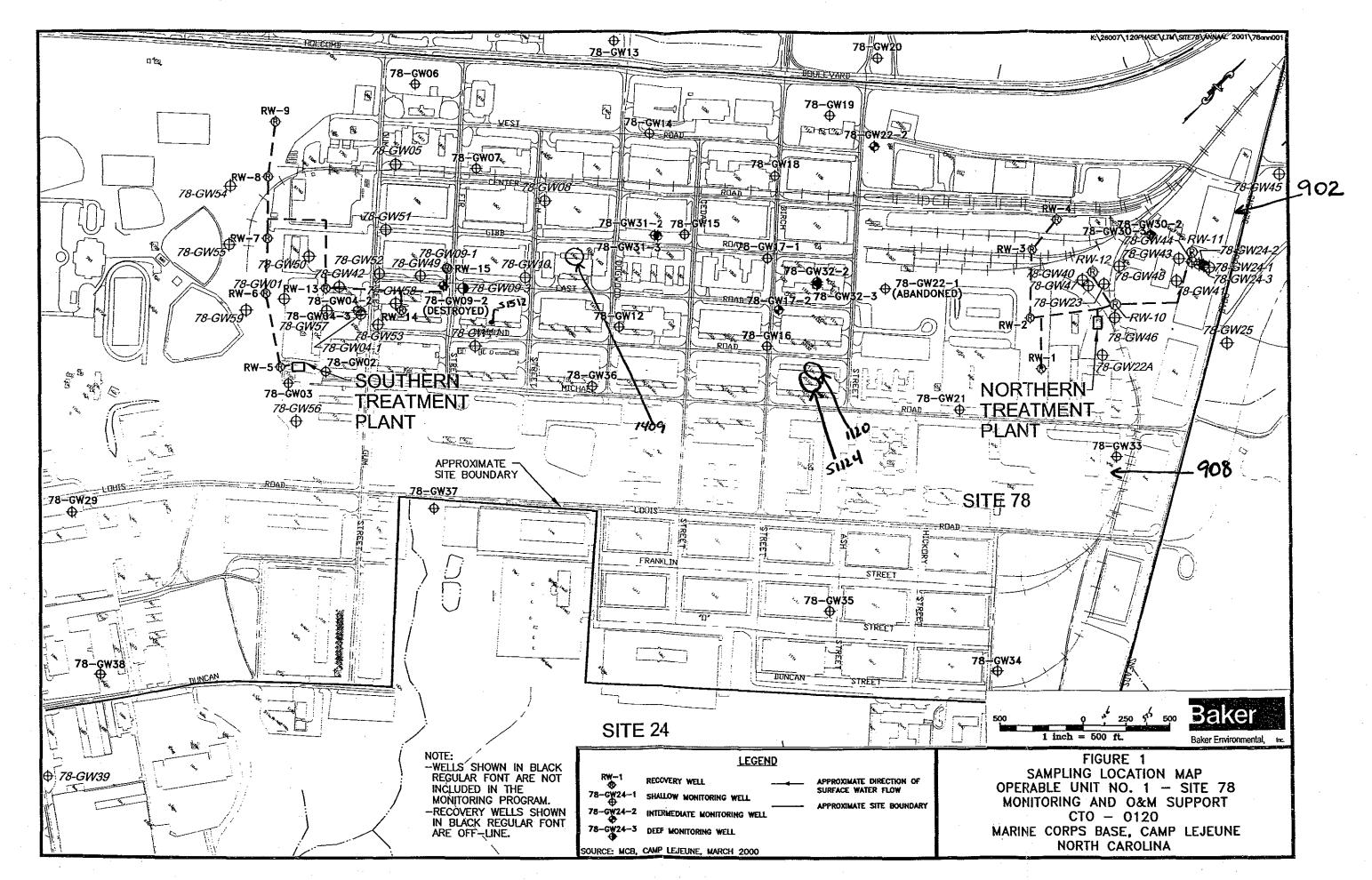


TABLE 8

SUMMARY OF WATER LEVEL MEASUREMENTS OPERABLE UNIT NO. 1 - SITE 78 MONITORING AND 0&M SUPPORT, CTO-0120 MCB, CAMP LEJEUNE, NORTH CAROLINA

Monitoring	Reference	SWE	SWE	SWL	SWE
Well	Elevation ⁽¹⁾	7/16/00	1/9/01	7/12/01	7/12/01
78-GW01	32.92	NA	NA	NA	NA
78-GW02	32.15	23.81	24.67	NA	NΑ
78-GW03	31.85	23.50	25.58	NA	NA
78-GW04-1	31.63	10.90	12.48	NA	NA
78-GW05	28.63	17.48	18.59	NA	NA
78-GW06	27.94	12.70	14.75	NA	NA
78-GW07	27.83	13.13	15.04	NA	NA
78-GW08	28.72	14.89	16.50	NA	NA
78-GW09-1	28.13	16.11	17.97	NA	NA
78-GW09-3	26.97	15.29	17.00	NA	NA
78-GW10	28.13	14.89	16.58	NA	NA
78-GW11	28.22	13.85	15.73	NA	NA
78-GW12	30.08	17.57	19.39	NA	NA
78-GW13	26.20	13.67	15.33	NA	NA
78-GW14	27.32	18.47	20.02	NA	NA
78-GW15	27.03	18.34	19.80	3.58	23.45
78-GW16	32.40	19.52	21.47	10.94	21.46
78-GW17-1	30.00	18.76	20.11	10.00	20.00
78-GW19	29.07	19.88	20.58	NA	NA
78-GW20	25.33	16.00	18.53	NA	NA
78-GW21	33.51	23.19	24.34	9.48	24.03
78-GW22A	32.36	23.16	25.54	6.80	25.56
78-GW23	32.08	20.77	23.53	9.24	22.84
78-GW24-1	32.84	23.87	25.69	6.60	26.24
78-GW24-2	33.73	20.05	23.29	11.44	22.29
78-GW24-3	32.32	18.48	21.65	11.65	20.67
78-GW25	32.58	22.37	25.21	7.42	25.16
78-GW33	29.84	22.22	24.19	5.77	24.07
78-GW34	32.66	NA	NA	5.86	26.80
78-GW35	32.08	NA	NA	12.99	19.09
78-GW36	29.86	16.44	18.27	NA	NA
78-GW39	19.44	3.63	3.94	NA	NA
78-GW40	31.34	19.67	23.71	8.95	22.39
78-GW41	29.54	22.65	24.02	5.53	24.01
78-GW42	28.52	NA	12.30	NΛ	NA
78-GW43	29.94	NA	23.49	8.45	21.49
78-GW44	30.25	NA	22.41	8.78	21.47
78-GW45	28.67	NA	23.74	6.18	22.49
78-GW46	30.51	NA	22.52	8.49	22.02
78-GW47	29.76	NA	22.33	8.43	21.33
78-GW48	29.21	NA	22.87	6.75	22.46

Notes:

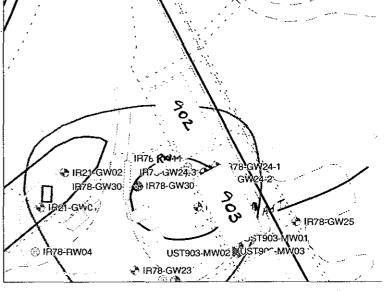
^{(1) =} Top of well casing expressed in feet above mean sea level.

SWL = Static water level taken from top of well casing.

HPIA HP902

Lejeune PA Site, Building HP902

Water Line
Wastewater Line
Storm Sewer
Electric Line
IR Wells Shallow Aquifer
IR Wells Castle Hayne Aquifer
Recovery Wells Shallow Aquifer
Recovery Wells Castle Hayne Aquifer
UST Wells Shallow Aquifer
UST Wells Castle Hayne Aquifer
Soil Boring Sample
Fence Line
Major Roads
Minor Roads



SCALE 1 : 5,399

200 0 200 400 600

PEET



Site Name: Building	HP902	
Site Number:		

PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

Approximate Area of Site (acres of	r square feet): Lingth of,	trea, located within Uo. 902 on Sneads Ferr Building -360' Widt
Approximate Area of Site (acres of Story = 64, 800 \$59 Direction to Site (from nearest pub	blic road): Located as	ions Sneeds Ferry K
	<u> </u>	
Name and Position of Site Contact	:	
Telephone Number:		
Weather Conditions:		
Describe Surrounding Land Use	North: Industria	(
Adjacent to the Site	South: Industrial	
	East: Industrial	
	West: Industria	<u>.</u>
Present Uses of Site: A	gricultural	Commercial
II	ndustrial	Undeveloped
R	esidential	
n.		
Describe use. The current	· Class II propurty o	and lists the building
as a Construction/W	leight Handling E	quipment Shop.
- HEAN EQUIDARNI STO	RAGE AND MAINTENA	ANCE

				
		Site Number:		
Former Uses of Site:	Agricultural Industrial Residential	 	Commercial Undeveloped	
Describe uses and leng	gths of time. <i>Construc</i>	ted 1948 as	an Ordnance	Warehouse
Early 1950's.	Small Arms Sho	p, including	Pakerizing Lac	cilities.
an armony w	on of building was as installed.	s-for equip	ment mainkno	ince. 1980
_	and commercial uses, descr			
Parkerizing,	bluing tank, st	crase areas	, battery Shop	, tool room
disal same	for repair and	L. manics	to clean wear	erens
Name of Tena	nts Type	of Use		<u>sed</u>
			· ·	
(page 22).	size, shape, and use of exis			
(page 22).		-> 125 L. Na p	ciat Incinteren	
- 1 certangules,	size, shape, and use of exis	-> issuing p	eint Incintence	
- 1 conquier,	size, shape, and use of exis heick structure -	-> issuing p	eint Incintence	
(page 22). - 1 (cotongoles, heavy equips) Site Housekeeping: 6 Describe Housekeeping	size, shape, and use of exis heick structure -	Poor:	eters)	ac of

*

nvironmental permits:					n.,
Type	· · · · · · · · · · · · · · · · · · ·	Agency	<u></u>	<u>Expiration</u>	<u>Date</u>
					
					_
					
scribe any emergency or i	remedial actions	that have o	ccurred at the	site.	
			<u> </u>		
and the second s				- Mari	_
			<u>i</u>		·
ource of information:					
					of building dwaters former us
hure are TR and uninty, existing enlamination un Drogram sites an					of building dwater former with a former with a found of the second of th
hure are TR and university, existing enstamination un Drogram sites an	UST monis y data sho du buildi cl me acs	worsha worsha y 902. hne site	Us boca Uni and o There as (900) i		dwater dwater former us nity of buil 90
hue are TR and uninty, wisting mlamination un program sites and aste Water Management:	UST monis y data sho du buildi cl me acs	toring we ness sha ty 902. thre site	Us boca Uni and o There as (900) i		dwater) former us inity of buil
hure are TR and uninty, existing on amination un program sites and aste Water Management: Onsite Septic System:	Domestic Yes Industrial Yes	toring we was shaden as 1902. The site	No No No	ect South	dwater) former us
Aute are TR and autently, existing and amination and Drosyam Sites and aste Water Management: Onsite Septic System: Public Sewer: Name of Agency:	Domestic Yes	toring we was shaden as 902.	No No Contact Pers	tect South	
Public Sewer:	Domestic Yes Industrial Yes Industrial Yes	toring we was Shades 1902. The site of th	No No Contact Pers	e Hue on	
Aute are TR and autently, existing and amination and brosyam Sites and aste Water Management: Onsite Septic System: Public Sewer: Name of Agency: Other:	Domestic Yes Industrial Yes Industrial Yes	toring we was shall a good . I have site	No No Contact Pers	tect South	

Site Name:

Site Name: _		***************************************		
Site Number:	 		 	

WASTE CHARACTERISTICS

Describe underground tanks onsite and identify on site sketch.

						Leak Detection/		
	Tank ID	Type and Capacity	Contents	Age	Location	Secondary Containment	Registered Y N	1200000
from UST(550scl.	Kerosene		903 (901)	State and the state of the stat		3 wellsite
section)		1,00056	Diesel tack		738	**************************************		NFA 3/25/
5		550gd.	Waste Oil		5-947/913)	·		NFA7/26/91
(5,000gel.	Diesel tank		900	<u></u>	Active Site	3 He Check
Starch >	[Waste Oil? Undersround	pre.1973	HP902	· · · · · · · · · · · · · · · · · · ·	•	8197
•			_		tome at the cite a	nd identify on	site sketch	

Describe underground hazardous material piping systems at the site and identify on site sketch

Location	Type of Pipe	Age	Type of Hazardous Material
		-	

*

Describe aboveground tanks onsite and identify on site sketch.

Tank ID	Type and Capacity		_Age	Location	Detection/ Secondary Containment	Registered Y N N/A
	150 gel AST	VSFO CI/	 :	SEE FILA.		

					·	

Area II	Paved_	Containment		<u>Containers</u>		
			17, 53gel	and-exalling	cillopes	
						
						
	i	of Material				
		·				
 						

*

Describe Discolored Soil.

<u>Location</u>	Areal Size	Color	<u>Odor</u>	Source
				

		Site Name:	
		Site Number:	
Stressed Vegetation:			
Location	Areal Size	Nature of Stress	Sour
		· · · · · · · · · · · · · · · · · · ·	
·			•
	***	818	
Odors:	·		
Location of Occurren	nce Des	scription	Source
			<u> </u>
Transformers:			
Manuf	acturer		
ID Nu	mber		
Presen	nce of PCB labels		
Fluorescent Light Ballast.	5.		
,	Presence of "N	o PCB" labels	
	Yes	No	
			
n :		·	
Describe onsite debris and		·	
Describe onsite debris and Area ID or Locat	d/or trash disposal ar	·	
·	d/or trash disposal ar	eas:	
·	d/or trash disposal ar	eas: Contents	
•	d/or trash disposal ar	eas: Contents	
Area ID or Locat	d/or trash disposal ar	eas: Contents	
Area ID or Locat	d/or trash disposal ar ion or barriers on accessi	eas: Contents bility to onsite waste mater	ials:
Area ID or Locat	d/or trash disposal ar ion or barriers on accessi	eas: Contents	ials:
Area ID or Locat	d/or trash disposal ar ion or barriers on accessi	eas: Contents bility to onsite waste mater	ials:
Area ID or Locat	or barriers on accessi	eas: Contents bility to onsite waste mater	ials:

	Site Number:
VASTE S	SOURCE SUMMARY
haracte	e this portion of the checklist only after all available current and historic waste ristics data have been gathered through the field reconnaissance and record search. So designed to help you delineate site sources for scoring purposes.
For each	source at the site, summarize in Table 1 (page 25):
, 1. i	Source Name
2.	Source Type (according to Source Type Descriptions in PA Guidance, page A-6)
3.	Size/volume/area of all features/structures that might contain hazardous waste
4.	Estimated waste quantity as measured onsite or from record search
5.	Types of hazardous substances handled
	Condition/integrity of each storage disposal feature or structure
	Sources of information for current site conditions and historical site conditions
, -	sources of information for earliest site continues and informations
and quan	pace below provide any additional information/clarification on waste source delineation itification (e.g., when waste source data is limited and the waste quantity is estimated conservative scoring purposes, documentation of method and rationale is required):
\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	

Site Name:

Si	te Number:
GROUNDWATER PATHWAY	
Groundwater at Site: (identify depth, quality, gradien	at. and use)
Depth to shallow soundwater is ~ 10 east to west across & Site 78.	
an no arishing water is used whin.	
In Table 2 (page 26), give names, descriptions, and chunits underlying the site.	
Number of onsite drinking: and monitoring: sketch (page 22).	wells. Show locations on site
Obtain boring logs and well completion diagrams if av	ailable.
Source of Site Drinking Water:	
Bottled Water: Yes No	· · · · · · · · · · · · · · · · · · ·
Wells Onsite: Yes No	
Public Water Supply: Yes No	
Name of Agency:	Contact Person;
Other:	Phone Number:
	to the terms of the second
Any positive or circumstantial evidence of a release to Describe:	groundwater? MISTOPIE MALE OF
Describe:	This building
- presence at contaminant plum	c south of bilding
- presence at contaminant plum. Source of information:	
Is a release to groundwater from current or historic so the following criteria and describe.) Are sources poorly contained? Is the source a type likely to contribute to groun	ources suspected? (Base this judgment on
Is waste quantity particularly large?	
Is precipitation heavy? Refer to RI	
Is the infiltration rate high?	

Site Name: _

	Site Name:
	Site Number:
	Is the site located in an area of karst terrain? R. Lu. to R.
	Is the site located in an area of karst terrain? Russ. to Rl Is the subsurface highly permeable or conductive?
	Is drinking water drawn from a shallow aquifer?
	Are suspected contaminants highly mobile in groundwater?
	Does analytical or circumstantial evidence suggest groundwater contamination?
	Other criteria?
ri	ibe.)
ri	ibe.) Is any drinking water well nearby?
ri	ibe.) Is any drinking water well nearby?
ri	Is any drinking water well nearby?
ri	Is any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate?
ri	Is any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate?
ri	Is any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected to exposed to a hazardous substance?
ri	Is any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected to exposed to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water we
ri	Is any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected to exposed to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water we
ri	Is any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected to exposed to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water we DO Does any drinking water well warrant sampling?
ri	Is any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected to exposed to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water we DO Does any drinking water well warrant sampling?
ri	Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected to exposed to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water we DO Does any drinking water well warrant sampling?
ri	Is any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected to exposed to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water well. Does any drinking water well warrant sampling? Other criteria?
ri	Is any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected to exposed to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water we Does any drinking water well warrant sampling? Other criteria?

		Site Name:	· · · · · · · · · · · · · · · · · · ·
,		Site Number:	
•		•	
Determine the locations	of and the number of pe	ople served by drinking	water wells that you
uspect have been expos	ed to hazardous substanc	es from the site.	
		· .	
			
			•
Discuss groundwater usa	nge within four miles of t	he site.	
		.	
Source of information:	# 4	- · · · · · · · · · · · · · · · · · · ·	
Summarize the nonulation	on served by groundwater	in the table below as n	sessured from the outer
	he source(s) to drinking v		
calculations in Table 3 (apportion in the
Distance			
(miles)	Population	_	
0 - 1/4		· 	
1/4 - 1/2			
1/2 - 1		-	•
			•••
1 - 2		-	
2 – 3		-	
3 - 4			
	·		
Source of information:	* *		
What is the distance to t	the nearest drinking wate	r well?	
wat is the distance to	_		
	See Klor	hicip	
Are any wellhead protec	tion areas present within	4 miles of the site?	
4			
rrigation, commercial li	om wells within 4 miles d vestock water, ingredient or supply for a major wa	in commercial food pre	eparation, supply for
,			•

•		Site Number:	
SURFACE-WATER PATI	<u>IWAY</u>		
dentify the surface-water	bodies that could potent	ially receive runoff from the site.	
Nearest Surface	water body is	the Bearer pam, Codgelo	Cu
of the Vin Ri	uu.	Commence of the Commence of th	
Discuss the probable surfa	ce runoff patterns from t	he site to surface waters.	
			u
Co Hectel along	You Bearen !	and Sediment samples w Dam & Codyls Cruk & L	/w
		he surface-water flow system for 15 down- ses are overland, intermittent, or perennial.	
Datarmine the average and	uual straam flow of downs	stream surface water for 15 downstream mi	ilac
Water body:		_ Flow: cfs	1163.
Water body:		Flow: cfs	
Water body:			
Water body:		flow: cfs flow: cfs	
-		Flow: cfs	
Source of information:			
Describe and locate on the PPE) of potential hazard		nap (page 23) the probable point of entry unial water body.	
Measure the shortest overland flow distance from any source to a perennial surface-water body (if part of the migration pathway is via intermittent drainages, include these drainages as part of the overland measurement; measure the course of water flow, not a straight line).			
s the site or portions ther		ter?	
What is the site flood freq	*		
°ORMS(6) - Fld-Insp	- 11		

Site Name:

	Is surface water nearby?
	Is waste quantity particularly large?
	Is the drainage area large?
	Is rainfall heavy?
	Is the infiltration rate low?
	Are sources poorly contained or prone to runoff or flooding?
	Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
	Is vegetation stressed along the probable runoff route?
	Are sediments or water unnaturally discolored?
	Is wildlife unnaturally absent?
	Has deposition of waste into surface water been observed?
	Is groundwater discharge to surface water likely?
	Does analytical or circumstantial evidence suggest surface-water contamination?
	Other criteria?
	·
Do 2 desc	any primary surface-water targets exist? (Base this judgment on the following criterizeribe.)
	Is any target nearby? If yes, specify below:
	Drinking water intake
	Fishery

Site Number:

	Site Number:
	Has any intake, fishery, or recreational area been closed?
	Does analytical or circumstantial evidence suggest surface-water contamination at or downstream of a target?
	Does any target warrant sampling? If yes, specify below:
	Drinking water intake
	Fishery
•	Sensitive environment
	Other criteria?
	Primary intake(s) identified?
	Primary fisher(ies) identified?
	Primary sensitive environment(s) identified?
	
Z	
SOU!	rce of information:
Are	any intakes part of a blended water supply system, and if so, how many other intakes or s supply the same system?
Are well	any intakes part of a blended water supply system, and if so, how many other intakes or
Are well Wha	any intakes part of a blended water supply system, and if so, how many other intakes or s supply the same system?
Are well Wha	any intakes part of a blended water supply system, and if so, how many other intakes or s supply the same system? It is the distance to the nearest drinking water intake?
Are well Wha	any intakes part of a blended water supply system, and if so, how many other intakes or s supply the same system? It is the distance to the nearest drinking water intake?
Are well Wha	any intakes part of a blended water supply system, and if so, how many other intakes or s supply the same system? It is the distance to the nearest drinking water intake?

Site Name:

	Site Name:	
	Site Number:	
Describe any sensitive enviro stream miles of the site.	onments (PA Guidance, PA Table 5, page A-3	1) within 15 down-
Measure the total length (or stream mile target distance l	frontage) of wetlands adjacent to surface waimit of the site.	ter along the 15 down-
		<u> </u>

	Site Name:
	Site Number:
COL	EVDOCIDE BATHWAY
	L EXPOSURE PATHWAY
Dese	ribe known surficial (within 2 feet of surface) areas of contamination on or adjacent to the
R	fer to RI
*	Visual evidence of run-on/runoff? Yes No
*	Visual evidence of run-on/runoff? Yes No Visual signs of contaminated run-on/ Yes No
	runoff?
Des	ription and direction of site runoff:
pote-	ntial).
	rmine if a resident population for the soil exposure pathway can be identified on the basis of ollowing criteria. Describe.
	Is any residence, school, or daycare facility on or within 200 feet of an area of suspected contamination?
	Is any residence, school, or daycare facility located on adjacent land previously owned or leased by the site owner/operator?
٠.	Is there a migration route that might spread hazardous substances near residences, schools or daycare facilities?
	Have onsite or adjacent residents or students reported adverse health effects, exclusive of apparent drinking water or air contamination problems?
	Does any neighboring property warrant sampling?
	Other criteria?

	Site Name:
	Site Number:
	Resident population identified?
	Determine the number of people occupying residences or attending school or daycare on or with 200 feet of areas of suspected contamination.
	Is the facility active?
	If yes, how many workers?
	if yes, now many workers:
	How many workers are employed at offsite facilities with suspected contamination?
•	Describe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) on an arof suspected contamination.
	Are commercial agriculture, commercial silviculture, commercial livestock production, or commercial livestock grazing present on areas of suspected contamination? Specify.
	No. lo
	$-\nu$ 0
	Determine the population (those who live, work, or attend school) within 1 mile of suspected surficial contamination.

Site Name:	
Site Number:	

AIR PATHWAY

Describe current or historic sources for which migration of hazardous substances to the air pathway could occur.

Past use may have had organic volatization. Current use would probably not have any hazardous air pathways it since

Is a release of hazardous substances to the air pathway suspected? (Base judgment on the following criteria and describe.)

Has release of a ha	~O	
	adverse health effects (e.g., headaches, nausea, dizz	
Does analytical or o	ircumstantial evidence suggest a release to the air?	<u> </u>
Other criteria?	Pt	
Suspected release?	NO	

Summarize the population within a four-mile radius of the site.

•	J	_
1	1	`

Distance (miles)	Population	
* Onsite		

- * 0 1/4
 - 1/4 1/2
 - 1/4 1/2
 - 1 2
 - 2 3
 - 3 4

Site Number:
ooundary of the sources available to the air pathway to ual can be a worker, resident, or student. Measure from building occupied by the nearest individual.)
nments (PA Guidance, PA Table 5, page A-31) within 0 ite.
1

Site Name: _	
Site Number:	

General Comments

Describe any additional information collected and clarify any issues previously addressed. Use this space to document any assumptions made for scoring purposes, and the rationale behind those assumptions.

Bldg	902	ANO	ACTIVIT	1ES	A350	<u> X</u> .AI	ED 1	w/ 1T	ANO	SULRO	UND	nk,	AREA
	ARE	<u>/\c\$1</u>	2146	ZY	THE	CA:	use/s	CURLÉ	0E	IR S	ITE	785	
. :			DAE.										
	STAG	ING	AREA	LE	403	Die	ECTZY	TC	THE	NOP	TH	PEOME	
	AREX	J					•						
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REFERENCES

Climate, Scology and all Physical Characteristics for
this area can be found in the Site 78 RI:
BAKER. June 1994. Final Romediae Investigation Report
Operable Unit No.1 (Sites 21, 24 +78). Prepared for the
Department of the Navy Atlantic Division Naval Facilities
Engineering Command.
engine critis continue a.
Jim Dolph: Historical Report

INTERVIEWS	•
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Site	Name:	
Site	Numbe	r:

Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.

	1	1
•		
	•	
of the second se		

Site Name:	
Site Number:	

Surface-Water Features

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

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Site Name:	
Site Number:	

Photo Log

*

	Photo Number	Description of Location	Looking Which Direction	Comments
(519) 1-	wesh ped	SOUTH	STOKED DROAS ON PAO
3ec	7-	steranc oca	5-14	HEAVY EUCIPHENT
	7-	1310- 9CZ	EAST	BAST NEST 3 DE OF BLOG
	4 -	Blg 902.	EA5+ (WETH SIDE
:	5-	Bldg 952	W2:57	- EAST SIDE
1	6-	Mangar strong one	west	- behind blog
525	7	Blig 902	west	- \$ 50014 SIDE

Source	Source Type	Sizo	Estimated			Sources of I	nformation
Source Name	Source Type (PA Guidance, page A-6)	Size (volume/area)	Estimated Waste Quantity	Specific Compounds	Containment ²	Current	Historical
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	· · · · · · · · · · · · · · · · · · ·						
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Use additional sheets if necessary.
 Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

Refer to RI

Table 2: Hydrogeologic Information¹

Strata Name/Description	Thickness (feet)	Hydraulic Conductivity (cm/sec)	Type of Discontinuity ²	Source of Information
	1 11 11 11 11 11 11 11 11 11 11 11 11 1			

¹ Use additional sheets if necessary.
2 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

Table 3: Apportionment Calculations for Drinking Water Wells¹

	. ,			,			
Distance Category (miles)	Well Number	Well Name	System	Population Served by System	Total Wells Supplying System	Population Served by Well	Total Population Served for Distance Category
0 - 1/4							
1/4 - 1/2							
1/2 - 1							
1 - 2							
2 - 3							
3 - 4							**************************************

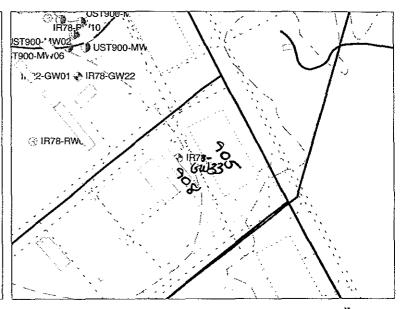
¹ See PA Guidance, pages 63 and 64 for additional guidance on apportionment.

HPIA

HP908

Lejeune PA Site, Building HP908

Wastewater Line
Storm Sewer
Electric Line
IR Wells Shallow Aquifer
IR Wells Castle Hayne Aquifer
Recovery Wells Shallow Aquifer
Recovery Wells Castle Hayne Aquifer
T Wells Shallow Aquifer
O UST Wells Castle Hayne Aquifer
Soil Boring Sample
Fence Line
Major Roads
Minor Roads



SCALE 1 : 5,399

200 0 200 400 600

FEET



Site Name: HP908	
Site Number:	

PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

SITE INFORMATION	
	Date: Time:
Site Location/Address: HPIA	, located within IR Site No. 78. Building
Approximate Area of Site (acres o	or square feet): Length - 100' x Width - 40' = 4,000 s
	blic road): From Sneads Ferry Road turn and, building 908 is on the left.
Name and Position of Site Contac	t:
Weather Conditions:	
Describe Surrounding Land Use Adjacent to the Site	North: Industrial South: East: West:
	Agricultural Commercial
Present Uses of Site:	
-	ndustrial Undeveloped
I	ndustrial Undeveloped

Indicates Field/Record Search Task

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		Site Name:	
		Site Number:	
Former Uses of Site:	Agricultural Industrial Residential	Commercial Undeveloped	
			_
Describe uses and leng	ths of time. 1948-Cons	ructed, Electronic Eq	juip. Storag
1949 - MCSDEL	ctromics Supply bivis	im Storage. 1952-19	163 Centra
For former industrial materials utilized.	mbat Vchicle Hair and commercial uses, describe	tructich, Electronic Equipment of the Maint Shop of the Maint Shop of the types of processes and hazardo	<i>f.Centres</i> P ous
Spray paint Paint, Lacqu	equip. Baking ove un thinner, Mine	n, Air Cumpressor, ral Spirits, vehic	Acid Tank le body rep
Is site used by Owne	er or Tenants	_	
Name of Tena	nts Type of U	Jse Length of T	Cime Used
Describe the number, (page 22).	size, shape, and use of existing	structures. Indicate locations	s on site sketch
7 3 50th Beno	n.A. 4 RAISEN STEFT, STRUCT	LRF , & PAIN LOCKER,	
Site Housekeeping:	Good: Average:	Poor:	
Describe Housekeepin	g Condition.		
LITTLE TO NO	SCLIO WASTE IN VIIIN	MY AREA ON SOM	TH 0F 908
DOES HAVE	Sonf Deblis		
Note: Thoma	s, su if there are is	a metal structure	arrind
this building	y and if it stores p	aint. Take some pic	tures
git (is the	ue).		

ivironmental permits:				
Туре		Адепсу	<u>Expiration</u>	Date
escribe any emergency (or remedial actions th	at have occurred at	the site.	
, 18		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
* In. 1				
urce of information:				
e/comparability, analy	tical methods, detecti	ions limits and QA/Q	OC).	
e/comparability, analy	tical methods, detecti	nons limits and QA/(OC).	uruncl this bull
e/comparability, analy Refer to RI - puilding. Thus	tical methods, detection Asoil & Gas Su Ligan IR	nons limits and QA/(C). performed U rex + to 5	uruncl this bull
e/comparability, analy Cufer to RI - building . Thu aste Water Managemen	tical methods, detection Asoil & Gas Su Ligan IR	nons limits and QA/(nonitring au No	C). performed U rex + to 5	uruncl this bull
e/comparability, analy Cufer to RI - building . Thu aste Water Managemen	tical methods, detection Asoil & Gas Sure in an IR t: m: Domestic Yes	nons limits and QA/C	C). performed of the state of	uruncl this bull
e/comparability, analy Cufur to RI ~ building . Thue aste Water Managemen Onsite Septic Syste Public Sewer:	t: Domestic Yes Industrial Yes	No No No No No	C). performed of the state of	Mirincl:
e/comparability, analy Cufur to RI ~ building . Thue aste Water Managemen Onsite Septic Syste Public Sewer: Name of Agency: _	t: m: Domestic Yes Industrial Yes Industrial Yes	No No No No No No Contact P	C). performed of the state of	Morinel:
Public Sewer: Name of Agency: _	t: m: Domestic Yes Industrial Yes Industrial Yes	No No No No No Phone Nu	CC). Performed of the state of	Morinel.

					Site Number:	·		
	WASTE CHA	RACTERIST	<u>TICS</u>					. Bering St.
*	Describe unde	erground tanl	ks onsite and id	entify on	site sketch.			
horm.	<u>Tank ID</u> WUST Sife	Type and Capacity 550504.	<u>Contents</u> Waste Oil	Age	<u>Location</u> (S-947(913	Leak Detection/ Secondary Containment		UFA 7/26/9(
							***************************************	- - -
*	Describe und	erground haz		piping sy	ystems at the site	e and identify on Type of		-
	Lo	cation		Pipe	Age	Hazardous M:	aterial	-
\ \								- - -
	Describe abov		ks onsite and id	entify on	site sketch.	Leak Detection/		
	Tank ID	Type and Capacity	Contents	Age	Location	Secondary Containment	Registered Y N N/A	

Describe	con	tainer sto	rage areas and i	dentify on site s	sketch.		
<u>Area I</u>	<u>D</u> _	Paved	Containment	No., Size, and Type of Containers	Condition of Containers		Eviden Rele
PAI	~ _	LOCKER		<u> </u>	1,000	PAINT	
	— · –						
			· ·				
							<u>-</u>
		<u>·</u> _					
List haz	ardo	us materi:	als used onsite.				
	4-3						
		Name	of Material		No. and	Size of Conta	ainers
		PAIN	TS. THINNER	25			
Describe identify	tatus e trea	s: N/A _ atment, st RCRA-re	Generator orage, and dispoegulated units.	TSD	Transporte	er Per	rmitted I
Describe identify	tatus e trea	s: N/A _ atment, st RCRA-re	Generator	TSD	Transporte	er Per	rmitted I
Describe identify	tatus e trea	s: N/A _ atment, st RCRA-re	Generator orage, and dispoegulated units.	TSD	Transporte	er Per	rmitted I
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Describe identify	e trez any Q¿R<	s: N/A _ atment, st RCRA-re	— Generator orage, and disponding orage of the second orage or the second orage or the second orage of the second orage or the second orage or the second orage or the second orage or the second orage or the second orage or the second orage or the second orage or the second orage or the second orage or the second orage or the second orage or the second orage or the second orage or the second orage or the second orage or the	TSD	Transporte	er Per	rmitted I
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Location	Areal Size	Nature of Stress	Sourc
Odors:			
Location of Occurrence	e Des	<u>cription</u>	Source
Transformers:			
Manufa			
ID Num	ber		
Presence	e of PCB labels		
Presence Fluorescent Light Ballasts:			
	Presence of "No	o PCB" labels	
	Presence of "No	o PCB" labels No	
Fluorescent Light Ballasts:	Presence of "No Yes or trash disposal are	o PCB" labels No	
Fluorescent Light Ballasts: Describe onsite debris and/	Presence of "No Yes or trash disposal are	PCB" labels No eas: Contents	M WASTE
Fluorescent Light Ballasts: Describe onsite debris and/ Area ID or Locatio	Presence of "No Yes or trash disposal are	PCB" labels No eas: Contents SE BUILDING / SO	IQ WASTE
Fluorescent Light Ballasts: Describe onsite debris and/ Area ID or Locatio DUMPSTER Describe any restrictions on	Presence of "No Yes or trash disposal are n barriers on accessit	PCB" labels No eas: Contents SE BUILDING / SO	ials:
Fluorescent Light Ballasts: Describe onsite debris and/ Area ID or Locatio DUMPSTER Describe any restrictions on	Presence of "No Yes or trash disposal are n barriers on accessit	PCB" labels No eas: Contents SE BUILDING SOI	ials:

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Site Number:
NASTE SOURCE SUMMARY
Complete this portion of the checklist only after all available current and historic waste characteristics data have been gathered through the field reconnaissance and record search. Table 1 is designed to help you delineate site sources for scoring purposes.
For each source at the site, summarize in Table 1 (page 25):
1. Source Name
2. Source Type (according to Source Type Descriptions in PA Guidance, page A-6)
3. Size/volume/area of all features/structures that might contain hazardous waste
4. Estimated waste quantity as measured onsite or from record search
5. Types of hazardous substances handled
6. Condition/integrity of each storage disposal feature or structure
7. Sources of information for current site conditions and historical site conditions
In the space below provide any additional information/clarification on waste source delineation and quantification (e.g., when waste source data is limited and the waste quantity is estimated high for conservative scoring purposes, documentation of method and rationale is required):

		Site	Number:
GROUNDWATER PATHWAY	<u>Y</u>		
Groundwater at Site: (identif	- 'v depth. au:	ality, gradient.	and use)
•			"
orphio siactions	LUURIOLEL S. : I . C	ode The	oprix. 10ft bgs. flow in Scrue is a Lucipmolinking wa
east to wish acros	wsite	is. jnu	is a fuel Francisking wa
and water use in	thisau	· · ·	
units underlying the site.	_		acteristics of geologic/hydrogeologic
Number of onsite drinking:sketch (page 22).	O and	monitoring:	wells. Show locations on site
Obtain boring logs and well c	ompletion d	iagrams if avai	table. Refer to RI
Source of Site Drinking Wate	r:		
Bottled Water:	Yes	No	
Wells Onsite:	Yes	No	<u> </u>
Public Water Supply:	Yes	No	<u></u>
Name of Agency:			Contact Person;
Other:			Phone Number:
Any positive or single-traction	1	flance to	
			roundwater?
Describe:		····	
Source of information		*,	
Source of information:			
Is a release to groundwater fi the following criteria and des		or historic sour	rces suspected? (Base this judgment on
Are sources poorly cont	ained?	<u> </u>	
	•		water contamination (e.g., wet lagoon)?
·			
Is precipitation heavy?			

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	Site Number:
I	s the site located in an area of karst terrain? Ryu to R!
	s drinking water drawn from a shallow aquifer?
	Are suspected contaminants highly mobile in groundwater?
I	Ooes analytical or circumstantial evidence suggest groundwater contamination?
(Other criteria?
-	
_	
-	
_	
۱I.	V DITHEAT V PROBLEMWATER TAILLEIS EXIST: TO ASE THIS RULPHIEBL OH THE TOLIOWING CITIETIA AIR
il	be.)
il	be.)
ii I	s any drinking water well nearby? <u>NO</u> Refue to R.
יוני נ	As any nearby drinking water well been closed?
'ili 	So any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate?
ili 1 1 1	s any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected to a hazardous substance?
iii	s any drinking water well nearby? Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Es any drinking water well located between the site and other wells that are suspected to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water water was a supplementation.
	s any drinking water well nearby? As any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water well of the site and other wells that are suspected to a hazardous substance?
	s any drinking water well nearby? As any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected texposed to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water well of the substance of the suggest contamination at a drinking water well warrant sampling?
	As any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected texposed to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water well oces any drinking water well warrant sampling?

	Site Maine:	
·	Site Number:	
	·	•
Determine the location suspect have been expe	ns of and the number of people served by drinking water osed to hazardous substances from the site.	wells that you
Discuss groundwater u	usage within four miles of the site.	
* · · · · · · · · · · · · · · · · · · ·		
Source of information	:	
most boundary(ies) of	ation served by groundwater in the table below as measured the source(s) to drinking water supply wells. Provide a page 27) if applicable.	red from the outer pportionment
Distance (miles)	Repulation	
0 - 1/4		
1/4 - 1/2		
1/4 - 1/2		
•		
1 - 2		
2 - 3		
3 - 4		
	•	
Source of information	ır	
What is the distance t	to the nearest drinking water well?	
	See RIN LUCIP	
Are any wellhead prot	tection areas present within 4 miles of the site?	
irrigation, commercial	from wells within 4 miles of the site used for commercial livestock water, ingredient in commercial food preparate, or supply for a major water recreation area? Specify	tion, supply for

•	Site Number:
SURFACE-WATER PATHWAY	
Identify the surface-water bodies that could	notentially receive runoff from the site
1	
and the New River.	dies one Beauce Dam, Codgels Crick
and the plus rivers.	<u> </u>
Discuss the probable surface runoff patterns	from the site to surface waters.
Legie to the RI, are above	nentained water budies have had
surface water + sediment	rentained water bodies have had sampling.
	and the surface-water flow system for 15 down- er courses are overland, intermittent, or perennial.
Determine the average annual stream flow of	f downstream surface water for 15 downstream miles.
Water body:	Flow: cfs
Water body:	
Source of information:	
Describe and locate on the surface water fea (PPE) of potential hazardous substance into	tures map (page 23) the probable point of entry a perennial water body.
Measure the shortest overland flow distance (if part of the migration pathway is via inter the overland measurement; measure the course	from any source to a perennial surface-water body mittent drainages, include these drainages as part of se of water flow, not a straight line).
Is the site or portions thereof located in surf	ace water?
No	
What is the site flood frequency?	
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*		Is surface water nearby?
*	•	Is waste quantity particularly large?
*		Is the drainage area large?
		Is rainfall heavy?
		Is the infiltration rate low?
*		Are sources poorly contained or prone to runoff or flooding?
*		Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
*		Is vegetation stressed along the probable runoff route?
*		Are sediments or water unnaturally discolored?
*		Is wildlife unnaturally absent?
*		Has deposition of waste into surface water been observed?
*		Is groundwater discharge to surface water likely?
*		Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?
		my primary surface-water targets exist? (Base this judgment on the following criteria and ribe.)
*		Is any target nearby? If yes, specify below:
		Drinking water intake
*		· · · · · · · · · · · · · · · · · · ·

Site Number:

	Site Number:
	Has any intake, fishery, or recreational area been closed?
	Does analytical or circumstantial evidence suggest surface-water contamination at or downstream of a target?
	Does any target warrant sampling? If yes, specify below:
	Drinking water intake
	Fishery
	Sensitive environment
	Other criteria?
	Primary intake(s) identified?
	Primary fisher(ies) identified?
	Primary sensitive environment(s) identified?
	tify location and population served by surface water drinking water intakes within 15 down m miles of the site.
Sour	ce of information:
	any intakes part of a blended water supply system, and if so, how many other intakes or supply the same system?
What	t is the distance to the nearest drinking water intake?
Desc	ribe and locate fisheries within 15 downstream miles of the site.
	ce of information:
Sour	CE OF INFORMACION.

	Site Name:
	Site Number:
Describe any sensitive environments (Pastream miles of the site.	A Guidance, PA Table 5, page A-31) within 15 down-
	·
Measure the total length (or frontage) stream mile target distance limit of the	of wetlands adjacent to surface water along the 15 down- site.

	Site Name:
	Site Number:
<u>son</u>	L EXPOSURE PATHWAY
Desc	ribe known surficial (within 2 feet of surface) areas of contamination on or adjacent to t
Ri Ri	fir to RI
·	
*	Visual evidence of run-on/runoff? Yes No
*	Visual signs of contaminated run-on/ Yes No runoff?
Desc	cription and direction of site runoff:
Dete	ermine if a resident population for the soil exposure pathway can be identified on the basifollowing criteria. Describe. Is any residence, school, or daycare facility on or within 200 feet of an area of suspecte contamination?
	Is any residence, school, or daycare facility located on adjacent land previously owned of leased by the site owner/operator?
	Is there a migration route that might spread hazardous substances near residences, scho or daycare facilities?
	Have onsite or adjacent residents or students reported adverse health effects, exclusive apparent drinking water or air contamination problems?
	Does any neighboring property warrant sampling?
	Other criteria? NO

	Site Name:
	Site Number:
	Resident population identified?
Det 200	ermine the number of people occupying residences or attending school or daycare on or withi feet of areas of suspected contamination.
Y 4	1.6.774
	he facility active? <u>US</u> es, how many workers? <u>3-5</u>
	w many workers are employed at offsite facilities with suspected contamination?
	many workers are employed at orisite facilities with suspected contamination.
Des of s	cribe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) on an are suspected contamination.
-	
Are con	commercial agriculture, commercial silviculture, commercial livestock production, or imercial livestock grazing present on areas of suspected contamination? Specify.
	NO
	ermine the population (those who live, work, or attend school) within 1 mile of suspected ficial contamination.
	· · · · · · · · · · · · · · · · · · ·

Site Name: _	 			 	
Site Number:	 	.=		 	

AIR PATHWAY

X

Describe current or historic sources for which migration of hazardous substances to the air pathway could occur.

Past use may have had organic volatilization from paints and la cquers. Current use would probably not have any hazardows air pathways.

V	
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11	

Is a release of hazardous substances to the air pathway suspected? (Base judgment on the following criteria and describe.)

Are odors currently reported or have they been reported in the past?

Has release of a hazardous substance to the air been directly observed?

Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?

Does analytical or circumstantial evidence suggest a release to the air?

Other criteria?	
Suspected release?	



Summarize the population within a four-mile radius of the site.

Distance (miles)	Population
* Onsite	
* 0 - 1/4	
1/4 - 1/2	
1/2 - 1	
1 - 2	
2 - 3	
3 - 4	

Sice Fulli	Deg:
Determine the distance from the outer boundary of the source the nearest individual. (Nearest individual can be a worker, the outer boundary of air sources to the building occupied by	resident, or student. Measure from
	•
Identify and locate any sensitive environments (PA Guidance to 1/4 mile and 1/4 to 1/2 mile of the site.	e, PA Table 5, page A-31) within 0

Site Name: _	 	
Site Number:	 	 · · · · · · · · · · · · · · · · · · ·

General Comments

Describe any additional information collected and clarify any issues previously addressed. Use this space to document any assumptions made for scoring purposes, and the rationale behind those assumptions.

<u>- 1H</u>	ere is	A 841	VI-BOCTH	LOCATED	IN 908,	THE	LARD	E AC
51	RUCTURE	(CNTHINS	VACOUN/	SCRUBBINE	, SYSTEM.	SEF	PIL	<u>526</u>
						· · · · · · · · · · · · · · · · · · ·		
								
					 			
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				··		 .		<u></u>

REFERENCES

Physical mara	expistics an	ed samplin	, informa	tim surround
Physical Mara This building ca	n be found	in the fall	wing rep	ort:
Baker June 10	lay. Finae	Remedial	Znvestigo	ution Report
Jim Dolph. 1-	fistorical Rep	ont.		
			-	
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				170

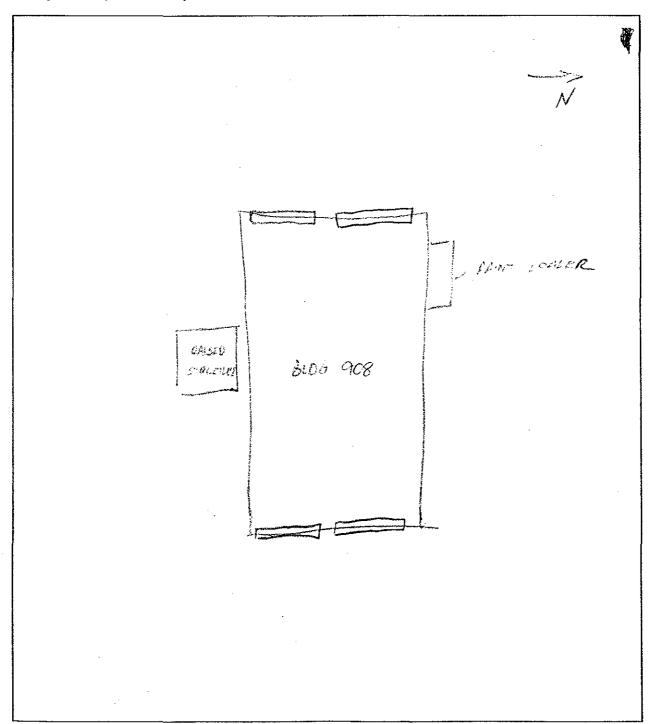
<u>INTERVIEWS</u>	
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	<u> </u>

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Site Name:	
Site Number:	

* Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.



Site	Name: _	
Site	Number:	

Surface-Water Features

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

·		N †
	. ••	
	•	

Site Name: _	HPC108
Site Number:	

H Photo Log

	Photo Number	Description of Location	Looking Which Direction	Comments
526	1 - 9	6°dg 908	WEST	SOTH SIDE (mised)
1	Z ~ PQ	Bldg 908	WBT	EAST SIDE (STRUCTURE)
	3- 10	B129 908	WEST	NORTH SIDE
	4- 11	PAINT LOCKER	BOUTH	PLCCERER ON NORTH SIDE
530	5- 12	Bldg 908	EAST	WEST SIDE

Table 1: Source Summary¹

Carrage	C T	g:				Sources of I	nformation
Source Name	Source Type (PA Guidance, page A-6)	Size (volume/area)	Estimated Waste Quantity	Specific Compounds	Containment ²	Current	Historical
							 [
						•	
					i		
		,			•		
			į				

			;				
			}				

Use additional sheets if necessary.

Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

Table 2: Hydrogeologic Information¹

Strata Name/Description	Thickness (feet)	Hydraulic Conductivity (cm/sec)	Type of Discontinuity ²	Source of Information
	<u> </u>			

¹ Use additional sheets if necessary.
2 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

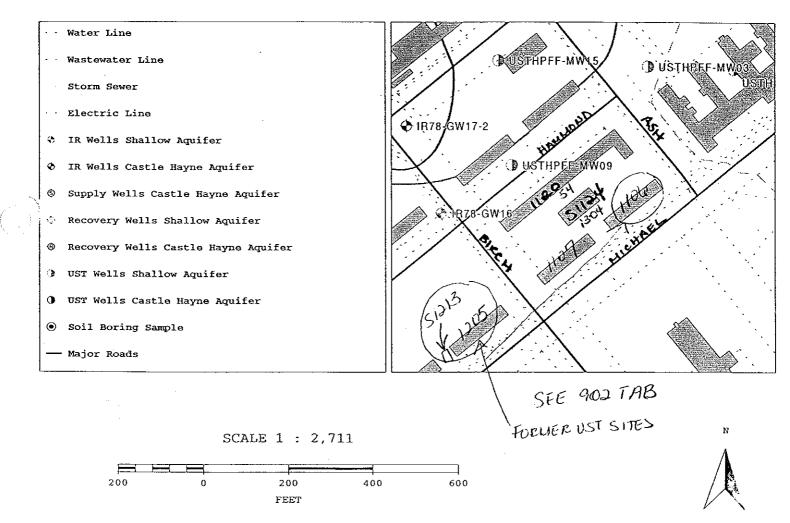
Table 3: Apportionment Calculations for Drinking Water Wells¹

				,			
Distance Category (miles)	Well Number	Well Name	System	Population Served by System	Total Wells Supplying System	Population Served by Well	Total Population Served for Distance Category
0 - 1/4							
1/4 - 1/2							
1/2 - 1							
1							l
							
1 - 2							
2 - 3							
3 - 4							
			····				

¹ See PA Guidance, pages 63 and 64 for additional guidance on apportionment.

HPIA HP1120

Buildings 1120 and S1124 Within Site 78



Site Name:	
Site Number:	

PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

•		Time:	,
Site Location/Address: いけん	HPIA, located a in IR Site Ho.	elong Hammond, Ash	and Biro
Approximate Area of Site	e (acres or square feet):	78 0 Lingth of building a pprice 3 Story = 11,250 52. ft.	75'x Wid-
Direction to Site (from n	earest public road):		
a francisco			
·			
Name and Position of Sit	e Contact:	<u> </u>	
Telephone Number:			
Weather Conditions:			
Describe Surrounding La	nd Use North: \mathcal{I}_{L}	ndustrial	
Adjacent to the Site		1	
	East:		
	West:	V	
Present Uses of Site:	Agricultural	Commercial	
Tresent Oses of Site:			
	Industrial	Undeveloped	l
_	Residential		
n A 1 11	111.81 -7 /		
Describe use. Auto H	unny snop:		

. 1

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	S	ite Number:		
Former Uses of Site:	Agricultural Industrial Residential	·	Commercial Undeveloped	·
Describe uses and lengths of Hobby Shop Paint S				
For former industrial and cormaterials utilized.	nmercial uses, describe t	ypes of processo	es and hazardous	
Guase Racks, Vehi Auto repair	cle lifts, Auto G	sast, Oil,	Wash Oil, p	Daint,
Is site used by OwnerName of Tenants	or Tenants Type of Us	e	Length of Time	e Used
Describe the number, size, sh (page 22).	ape, and use of existing	structures. Ind	icate locations on	site sketo
BAYS W/ HYORALLIC	LIFTS + PAINT BOOT		,	
Site Housekeeping: Good:	Average:	Poor:		
Describe Housekeeping Cond				
_ RANDOM SOLO WAS	TE GTERED ON TRA	IER AND A	DJALENT 70	<u> 121124 </u>

				Expiration Date
Туре		Agency		Expiration Date
Туре		Agency		Expiration Date
		Agency		Expiration Date
				
4.34				w-
				· · · · · · · · · · · · · · · · · · ·
				
Describe any emergency or	remedial ac	tions that have	occurred at the s	ite.
Source of information:				
			14500	1.00 mg (1.00 mg) (1.00 mg
There are 2 forme UST Program site (H is located North of	buildin	y 1/20.	THING IT BUILD	119 11-0 - 11-0 11
Waste Water Management:				
Onsite Septic System:			No	
		Yes	No	
Public Sewer:	Domestic Industrial	Yes Yes	No	
	muusman	1es <u> </u>	110	
Name of Agency:			Contact Person	n
Other:			Phone Number	
Describe onsite wastewater	treatment s	ystems.		
		ystems.		

Site Name:	 	
Site Number:	 	

Leak

WASTE CHARACTERISTICS

*	Describe underground tanks onsite and identify on site sketch.	Su	fisure	
---	--	----	--------	--

Tank ID	Type and Capacity 550 Sul. W 500 Sul. US Farmer fuel	ed Oil	Age	<u>Location</u> 1106 1205/S-1213 HPFF/1115	Detection/ Secondary Containment	 C5A 1997 pfA6/28
	\$					

Describe underground hazardous material piping systems at the site and identify on site sketch.

Location	Type of Pipe	Age	Type of Hazardous Material
		· ·	

Describe aboveground tanks onsite and identify on site sketch.

Tank ID	Type and Capacity	Contents	Age	Location	Detection/ Secondary Containment	
 						
						·

Describe conta	iner sto	rage areas and id	lentily on site			
Area ID P	aved	Containment	No., Size, and Type of Containers			Evidence Release
			-11-0-			
List hazardous		als used onsite.		N. 16		•
	Name	of Material		No. and S	Size of Conta	inerc
Fr.						
	/3/c	1.3 / LUBES / H	YORAULK	<u>.</u>		
	/3/c	15 / LUBES / H	YORAULK	<u>.</u>		
	/3/c	15 / LUBES / H	YORAULK	<u>.</u>		
<u> </u>	r3 /c1 L0103	15 / LUBES / H	TY DRAULE			
RCRA status:	vis / c) voios N/A _	Generator	TSD _	Transporte	er Pei	rmitted ISD
RCRA status:	N/A _	Generator orage, and dispos	TSD _	Transporte	er Pei	rmitted ISD
RCRA status: Describe treatridentify any R	N/A _	Generator orage, and dispos	TSD _	Transporte	er Per	rmitted ISD
RCRA status: Describe treatridentify any R	N/A _	Generator orage, and disposegulated units.	TSD _	Transporte	er Per	rmitted ISD
RCRA status: Describe treatridentify any R	N/A _	Generator orage, and disposegulated units.	TSD _	Transporte	er Per	rmitted ISD
RCRA status: Describe treatridentify any R	N/A _	Generator orage, and disposegulated units.	TSD _	Transporte	er Per	rmitted ISD
RCRA status: Describe treatridentify any R	N/A	Generator orage, and disposegulated units.	TSD _	Transporte	er Per	rmitted ISD
RCRA status: Describe treatridentify any Re	N/A	Generator orage, and disposegulated units.	TSD _	Transporte	er Per	rmitted ISD

Stressed Vegetation:			
Location	Areal Size	Nature of Stress	Sourc
·		<u> </u>	
	<u> </u>	· · · · · · · · · · · · · · · · · · ·	
Odors:			
Location of Occ	urrence Desc	cription	Source
	<u> </u>		
-			
Transformers:			
М	anufacturer		
II) Number		
P ₁	resence of PCB labels		
Fluorescent Light Ba	llacte:		
A Morescent Digite Da	Presence of "No	PCB" labels	
	Yes	•	
Describe onsite debri	s and/or trash disposal are	as:	
Area ID or L	ocation	Contents	
	LANGE	A sello was TE	4
			\w
Describe any restrict	ons or barriers on accessib	ility to onsite waste mater	ials:
	UNI		
	, 		
Describe any signs of	unauthorized human activ	ity:	

Sit	Name:
Sit	Number:
	ilable current and historic waste
	ld reconnaissance and record search. r scoring purposes.
(pag	25):

WASTE SOURCE SUMMARY

Complete this portion of the checklist only after all available current and historic waste characteristics data have been gathered through the field reconnaissance and record search. Table 1 is designed to help you delineate site sources for scoring purposes.

For each source at the site, summarize in Table 1 (page 25):

- 1. Source Name
- 2. Source Type (according to Source Type Descriptions in PA Guidance, page A-6)
- 3. Size/volume/area of all features/structures that might contain hazardous waste
- 4. Estimated waste quantity as measured onsite or from record search
- 5. Types of hazardous substances handled
- 6. Condition/integrity of each storage disposal feature or structure
- 7. Sources of information for current site conditions and historical site conditions

 _	"	_	-	
			`	

Site Name:
· Site Number:
radient, and use)
anoras 10.11. 655. Flow is annual
apprix. 10 ft. b35. Flow is generally
and characteristics of geologic/hydrogeologic
s. e tisue
oring: wells. Show locations on site
į
s if available.
0
0
0
Contact Person;
Phone Number:
ase to groundwater?
-
*,
oric sources suspected? (Base this judgment on
groundwater contamination (e.g., wet lagoon)?

	Site Number:
	Is the site located in an area of karst terrain?
	Is the site located in an area of karst terrain? Is the subsurface highly permeable or conductive?
	Is drinking water drawn from a shallow aquifer?
	Are suspected contaminants highly mobile in groundwater?
	Does analytical or circumstantial evidence suggest groundwater contamination?
	Other criteria?
,	Other Cheria:
٠	
	Is any drinking water well nearby? NO Ryu to RI LUCIP Has any nearby drinking water well been closed?
	1
	Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate?
	Is any drinking water well located between the site and other wells that are suspected to exposed to a hazardous substance?
	Does analytical or circumstantial evidence suggest contamination at a drinking water we
	Does any drinking water well warrant sampling?
	Does any drinking water well warrant sampling?

	•	Site Name:	
		Site Number:	
Determine the locations of suspect have been exposed	A and the number of people to hazardous substances	e served by drinking from the site.	water wells that you
		÷	
···			<u> </u>
Discuss groundwater usag	e within four miles of the	site.	
Ponte of information; -			
Summarize the population most boundary(ies) of the calculations in Table 3 (p	n served by groundwater in e source(s) to drinking wat	er supply wells. Pro	measured from the outer ovide apportionment
carculations in Table 3 (p	age 27) ii applicatie.		•
Distance	Population		
(miles)	ropulation		
0 - 1/4			
1/4 1/2			
1/2 - 1			
1 - 2			
2 - 3			
3 - 4	·		
Source of information: _		· · · · · · · · · · · · · · · · · · ·	<u> </u>
			•
What is the distance to the	ne nearest drinking water v		
	Su RI n	MUCIP	
	_		
Are any wellhead protect	ion areas present within 4	miles of the site?	
			•
irrigation, commercial liv	m wells within 4 miles of estock water, ingredient in r supply for a major water	commercial food page	reparation, supply for

	Site Num	ber:	
SURFACE-WATER PATHWAY			
Identify the surface-water bodies that	could potentially rece	eive runoff fro	om the site.
Nearest surface water	-		•
I the Use River.			
4 42 Wasse Printer			
Discuss the probable surface runoff pa	tterns from the site to	surface wate	rs.
Refer to RI Surface water	1 x sed samp	leg have	bus taken at
he above mentioned a	satu bedier		
Provide a simplified sketch of surface stream miles (page 23). Identify which			
Determine the average annual stream f	low of downstream su	rface water fo	or 15 downstream miles.
Water body:	Flov	v: c1	īs —
Water body:		v: ci	fs
Water body:	Flow	v: ci	Ts .
Water body:	Flov	v: ci	fs
Water body:	`	v: ci	fs
Course of informations			
Source of information:			
Describe and locate on the surface wat (PPE) of potential hazardous substance			able point of entry
Measure the shortest overland flow dis (if part of the migration pathway is via the overland measurement; measure the	a intermittent drainag	es, include th	ese drainages as part of
Is the site or portions thereof located in	n curface water?		.4
1/0	n surface water.		
		. •	
What is the site flood frequency?			
FORMS(6) - Fld-Insp			
0402041492	11		\$1.00 S

Site Name: _	
Site Number:	

Any positive or circumstantial evidence of surface-water contamination from current or historic sources? (Base this judgment on the following criteria and describe.)

*	Is surface water nearby? NO
*	Is waste quantity particularly large?
*	Is the drainage area large?
	Is rainfall heavy?
	Is the infiltration rate low?
*	Are sources poorly contained or prone to runoff or flooding?
X.	Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
K *	Is vegetation stressed along the probable runoff route?
K *	Are sediments or water unnaturally discolored?
*	Is wildlife unnaturally absent?
*	Has deposition of waste into surface water been observed?
*	Is groundwater discharge to surface water likely?
*	Does analytical or circumstantial evidence suggest surface-water contamination?
*	Other criteria?
	Do any primary surface-water targets exist? (Base this judgment on the following criteria and describe.)
*	Is any target nearby? If yes, specify below:
*	Drinking water intake
*	Fishery
*	Sensitive environment

fource of information: Are any intakes part of a blended water supply system, and if so, how many other intakes or		Site Number:
Does analytical or circumstantial evidence suggest surface-water contamination at or downstream of a target? Does any target warrant sampling? If yes, specify below: Drinking water intake Fishery Sensitive environment Other criteria? Primary intake(s) identified? Primary sensitive environment(s) identified? Primary sensitive environment(s) identified? dentify location and nopulation served by surface water drinking water intakes within 15 downtream miles of the site. Source of information: are any intakes part of a blended water supply system, and if so, how many other intakes or rells supply the same system? What is the distance to the neacest drinking water intake?	. \	
downstream of a target? Does any target warrant sampling? If yes, specify below: Drinking water intake Fishery Sensitive environment Other criteria? Primary intake(s) identified? Primary fisher(ies) identified? Primary sensitive environment(s) identified? dentify location and population served by surface water drinking water intakes within 15 downtream miles of the site. Source of information: are any intakes part of a blended water supply system, and if so, how many other intakes or wells supply the same system? What is the distance to the nearest drinking water intake?	Has any intake, fishery	, or recreational area been closed?
Drinking water intake Fishery Sensitive environment Other criteria? Primary intake(s) identified? Primary fisher(ies) identified? Primary sensitive environment(s) identified? dentify location and population served by surface water drinking water intakes within 15 downtream miles of the site. Figure any intakes part of a blended water supply system, and if so, how many other intakes or rells supply the same system? What is the distance to the nearest drinking water intake?	Does analytical or circu downstream of a target?	
Sensitive environment Other criteria? Primary intake(s) identified? Primary fisher(ies) identified? Primary sensitive environment(s) identified? dentify location and population served by surface water drinking water intakes within 15 downtream miles of the site. Source of information: are any intakes part of a blended water supply system, and if so, how many other intakes or wells supply the same system? What is the distance to the nearest drinking water intake?	Does any target warrant	sampling? If yes, specify below:
Sensitive environment Other criteria? Primary intake(s) identified? Primary fisher(ies) identified? Primary sensitive environment(s) identified? dentify location and population served by surface water drinking water intakes within 15 downtream miles of the site. Fource of information: are any intakes part of a blended water supply system, and if so, how many other intakes or wells supply the same system? What is the distance to the nearest drinking water intake?	Drinking water intal	ke
Sensitive environment Other criteria? Primary intake(s) identified? Primary fisher(ies) identified? Primary sensitive environment(s) identified? dentify location and population served by surface water drinking water intakes within 15 downtream miles of the site. Fource of information: are any intakes part of a blended water supply system, and if so, how many other intakes or wells supply the same system? What is the distance to the nearest drinking water intake?	Fishery	
Other criteria? Primary intake(s) identified? Primary fisher(ies) identified? Primary sensitive environment(s) identified? dentify location and population served by surface water drinking water intakes within 15 downtream miles of the site. Gource of information: are any intakes part of a blended water supply system, and if so, how many other intakes or wells supply the same system? What is the distance to the nearest drinking water intake?	and the second s	
Primary fisher(ies) identified? Primary sensitive environment(s) identified? dentify location and population served by surface water drinking water intakes within 15 downtream miles of the site. Source of information: are any intakes part of a blended water supply system, and if so, how many other intakes or wells supply the same system? What is the distance to the nearest drinking water intake?	Other criteria?	
Primary sensitive environment(s) identified? dentify location and population served by surface water drinking water intakes within 15 downtream miles of the site. fource of information: are any intakes part of a blended water supply system, and if so, how many other intakes or vells supply the same system? What is the distance to the nearest drinking water intake?	Primary intake(s) identi	ified?
dentify location and population served by surface water drinking water intakes within 15 downtream miles of the site. Source of information: Are any intakes part of a blended water supply system, and if so, how many other intakes or wells supply the same system? What is the distance to the nearest drinking water intake?	Primary fisher(ies) iden	ntified?
fource of information: Are any intakes part of a blended water supply system, and if so, how many other intakes or vells supply the same system? What is the distance to the nearest drinking water intake?	Primary sensitive enviro	onment(s) identified?
fource of information: Are any intakes part of a blended water supply system, and if so, how many other intakes or vells supply the same system? What is the distance to the nearest drinking water intake?		
Source of information: Are any intakes part of a blended water supply system, and if so, how many other intakes or vells supply the same system? What is the distance to the nearest drinking water intake?	Identify location and populat stream miles of the site.	ion served by surface water drinking water intakes within 15 down
Are any intakes part of a blended water supply system, and if so, how many other intakes or vells supply the same system? What is the distance to the nearest drinking water intake?		
Are any intakes part of a blended water supply system, and if so, how many other intakes or vells supply the same system? What is the distance to the nearest drinking water intake?		
Are any intakes part of a blended water supply system, and if so, how many other intakes or vells supply the same system? What is the distance to the nearest drinking water intake?	Source of information:	
Vells supply the same system? What is the distance to the nearest drinking water intake?		
	Are any intakes part of a bler wells supply the same system:	nded water supply system, and it so, how many other intakes or?
Describe and locate fisheries within 15 downstream miles of the site.	What is the distance to the no	earest drinking water intake?
Describe and locate fisheries within 15 downstream miles of the site.		
Describe and locate fisheries within 15 downstream miles of the site.	Dec 11 11 4 - 61 1 - 1 - 1	
	Describe and locate fisheries	within 15 downstream miles of the site.
ource of information:	Source of information:	

	Site Name:
	Site Number:
Describe any sensitive environm stream miles of the site.	ents (PA Guidance, PA Table 5, page A-31) within 15 down-
at his on the state of the stat	
Measure the total length (or frostream mile target distance limit	ontage) of wetlands adjacent to surface water along the 15 down- it of the site.
	·

SOII	L EXPOSURE PATHWAY				
Desc site.	ribe known surficial (within 2 feet of surface	e) areas of co	ntamination	on or adj	acent
: 15					
*	Visual evidence of run-on/runoff?	Yes	No 🔟		
*		Yes			
	runoff?				
Desc	ription and direction of site runoff:				
	·				
Surf	ace-water run-on from neighbor's property (i ntial).				amina
Surf pote	ace-water run-on from neighbor's property (i	dentify sour			amina
Surf pote	ace-water run-on from neighbor's property (i ntial).	dentify sour			amina
Surf pote	ace-water run-on from neighbor's property (i ntial).	dentify sour			amina
Surf pote	ace-water run-on from neighbor's property (i ntial).	dentify sour			amina
Surf poter Dete	ace-water run-on from neighbor's property (intial).	dentify source	ce directions	and conta	
Surf poter Dete	ace-water run-on from neighbor's property (intial). rmine if a resident population for the soil expressions or the soil expressions.	dentify source	ce directions	and conta	n the
Surf poter Dete	ace-water run-on from neighbor's property (intial). rmine if a resident population for the soil explosions criteria. Describe.	dentify source	ay can be id	and conta	n the
Surf poter Dete	ace-water run-on from neighbor's property (intial). rmine if a resident population for the soil expectation of the soil expec	dentify source	ay can be id	and conta	n the
Surf poter Dete	ace-water run-on from neighbor's property (intial). rmine if a resident population for the soil explosions criteria. Describe.	dentify source oosure pathw on or within	ay can be ide	and conta	n the suspe
Surf poter Dete	ace-water run-on from neighbor's property (intial). rmine if a resident population for the soil explosions criteria. Describe. Is any residence, school, or daycare facility contamination? Is any residence, school, or daycare facility	oosure pathwoon or within	ay can be idea at a can be idea.	and conta	n the suspe
Surf poter Dete	ace-water run-on from neighbor's property (intial). rmine if a resident population for the soil explosion of	oosure pathw on or within located on ac	ay can be identifications 200 feet of ligacent land substances new verse health	and conta	n the suspective owners, see such such such sees su
Surf poter Dete	ace-water run-on from neighbor's property (intial). rmine if a resident population for the soil exploit of the soil exploit of the soil exploit of the soil exploit of the soil exploit of the soil exploit of the soil exploit of the soil exploit of the soil exploit of the soil exploit of the soil exploit of the soil exploit of the soil of the soil exploit of the so	oosure pathw on or within located on ac hazardous so reported ad n problems?	ay can be identifications 200 feet of ligacent land substances new verse health	and conta	n the l suspe y owne ces, se

	Site Name:
	Site Number:
	Resident population identified?
	-
	Determine the number of people occupying residences or attending school or daycare on or wing 200 feet of areas of suspected contamination.
	Is the facility active?
	ľ
	If yes, how many workers? 4-5 (BUSY ON WEEKENDS / AFTERNOCESS)
	How many workers are employed at offsite facilities with suspected contamination?
•	
	Describe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) on an of suspected contamination.
	Are commercial agriculture, commercial silviculture, commercial livestock production, or commercial livestock grazing present on areas of suspected contamination? Specify.
	NO
	Determine the population (those who live, work, or attend school) within 1 mile of suspected surficial contamination.

Site Name: _	 	
Site Number:	 	

AIR PATHWAY

V	
1	

Describe current or historic sources for which migration of hazardous substances to the air pathway could occur.

PAINT	BOOTH	1	51174	SEE PILS.			
				-		•	



Is a release of hazardous substances to the air pathway suspected? (Base judgment on the following criteria and describe.)

, ~	Are odors currently reported or have they been reported in the past?
g.	Has release of a hazardous substance to the air been directly observed?
•	Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentiall resulting from migration of hazardous substances through the air?
	Does analytical or circumstantial evidence suggest a release to the air?
	Other criteria?
	Suspected release?

Summarize the population within a four-mile radius of the site.



Distance (miles)	Population
* Onsite	
* 0 - 1/4	
1/4 - 1/2	
1/2 - 1	
1 - 2	
2 - 3	
3 – 4	

-	Site Name:
	Site Number:
the nearest individua	nce from the outer boundary of the sources available to the air pathway to al. (Nearest individual can be a worker, resident, or student. Measure from of air sources to the building occupied by the nearest individual.)
	any sensitive environments (PA Guidance, PA Table 5, page A-31) within 0 to 1/2 mile of the site.
	and the second of the second o

	•	Site Name:	
		Site Number:	
General Comments			
Describe any additions this space to documen those assumptions.	al information collecte t any assumptions mad	d and clarify any issues le for scoring purposes, a	previously addressed. Use nd the rationale behind
NOTE THAT	A DAINT BOCTH 15	5 W1124,	
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REFERENCES

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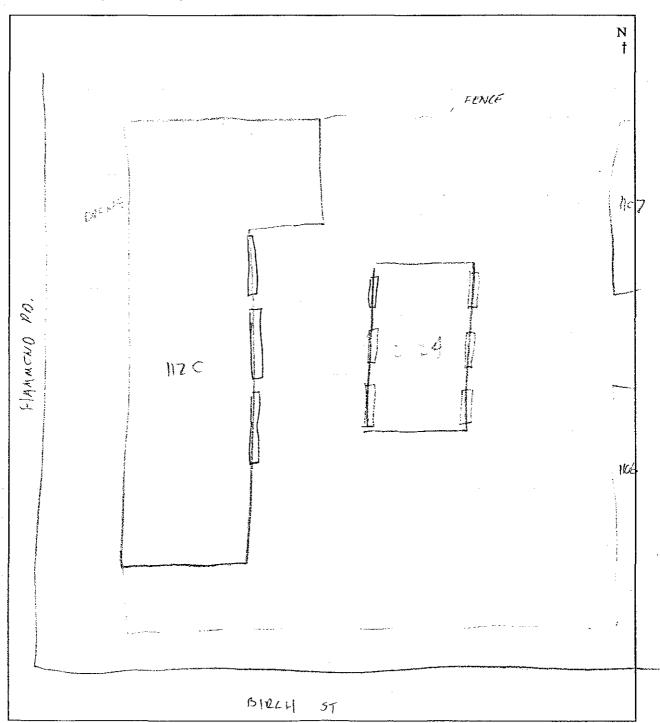
INTERVIEWS				
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	<u>.</u>			

Site Name:	
Site Number:	

Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.



Site Name: _	
Site Number:	

Surface-Water Features

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

			N †

Site Number:

X

Photo Log

531 <u>~</u>	Photo Number	Description of Location	Looking Which Direction	Comments	.
532	71-13	Bldg 112C V	NORTH	XUT 3:0E	
: 1	2- 18	B14= 1124	NORTH	SCLTH SIDE	
	3- 14	Blde 190 1	WEST	3 85 1103	٠.
	4 - 10	, Blog 1124	√ £5₹	EAST SIDE (PAINT ACCT.
	5- 15	B145 1170	₩£ŚŢ	ACOND, EMI 3100	
	6 - 2	0 1124	30 UTH	40 874 8108	
	(7-		EAST	NP9 510E	
537	7	1.7 C	50011	ACMIE SIDE	
538	8 - r	n 1-20	EAST	70151 SIDE	
541 //	Ø - 1	1 1124	EAST	WEST SINE (THAT SOUTH
539 9	te- 2	1724		HAZWANGE	
540 10		3 1724		PAINT DO	774

Table 3: Apportionment Calculations for Drinking Water Wells¹

	and the second second			4.7%			<u> </u>
Distance Category (miles)	Well Number	Well Name	System	Population Served by System	Total Wells Supplying System	Population Served by Well	Total Population Served for Distance Category
0 - 1/4							
		·					
		····					•
1/4 - 1/2				1			
1/4 - 1/2							
		, - _{V-10-V} m					
1/2 - 1							
•		······································					
							**
1 - 2							
n n							
2 - 3						<u></u>	
			· · · · · · · · · · · · · · · · · · ·				
3 - 4							
•							·
1							

¹ See PA Guidance, pages 63 and 64 for additional guidance on apportionment.

Table 1: Source Summary¹

Source	Source Type	Size	Estimated			Sources of I	nformation
Name	Source Type (PA Guidance, page A-6)	(volume/area)	Estimated Waste Quantity	Specific Compounds	Containment ²	Current	Historical
						••••	
				,			
		ļ					
				-			
		r salahan karana			·		
		- Landers			e e		
		and the second s					
L	1						

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Use additional sheets if necessary.
 Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

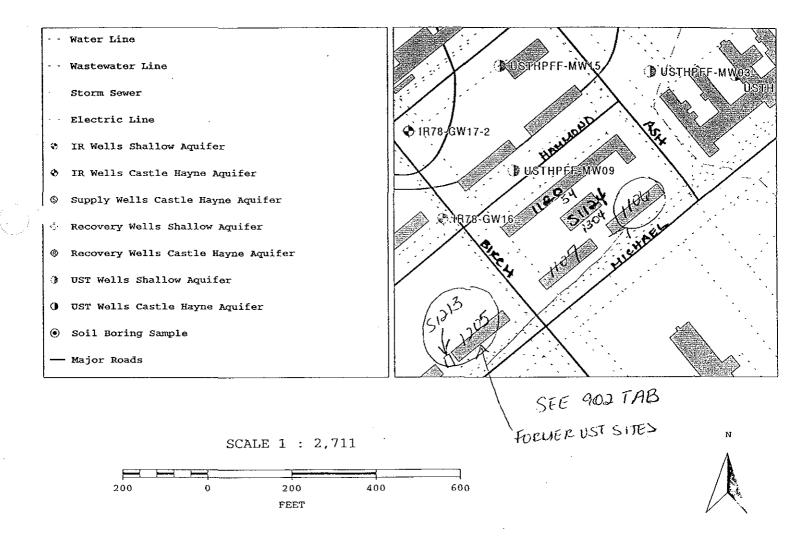
Table 2: Hydrogeologic Information¹

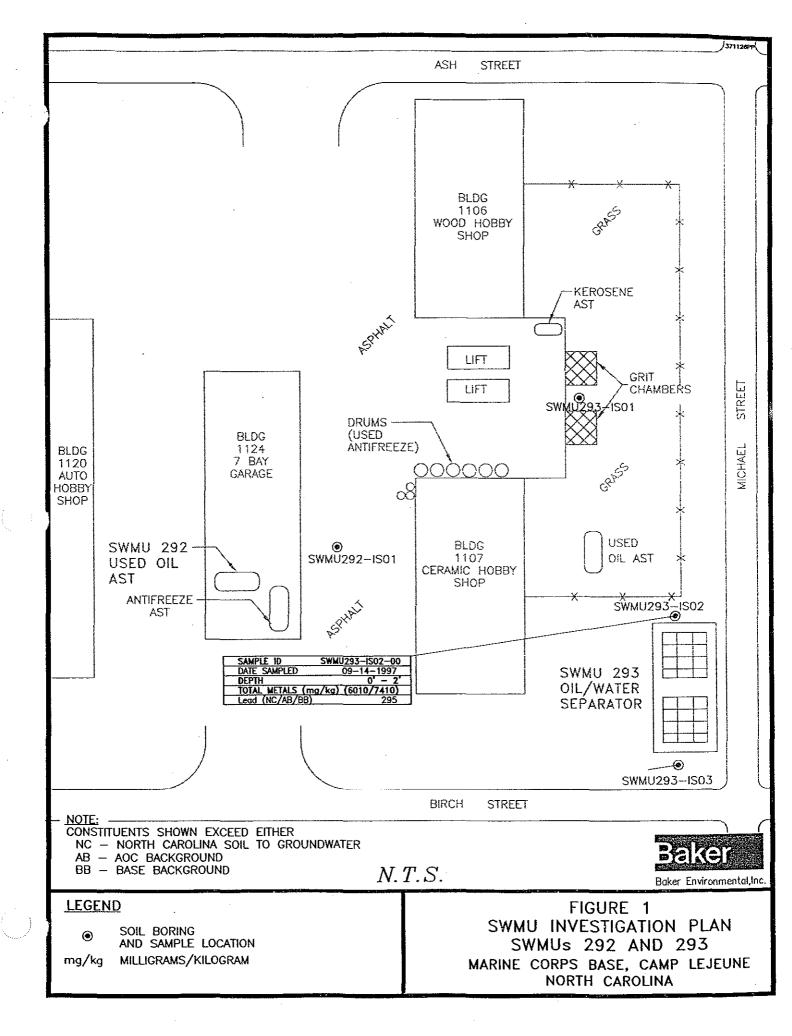
Strata Name/Description	Thickness (feet)	Hydraulic Conductivity (cm/sec)	Type of Discontinuity ²	Source of Information
				·
				} :
			,	
	.]			

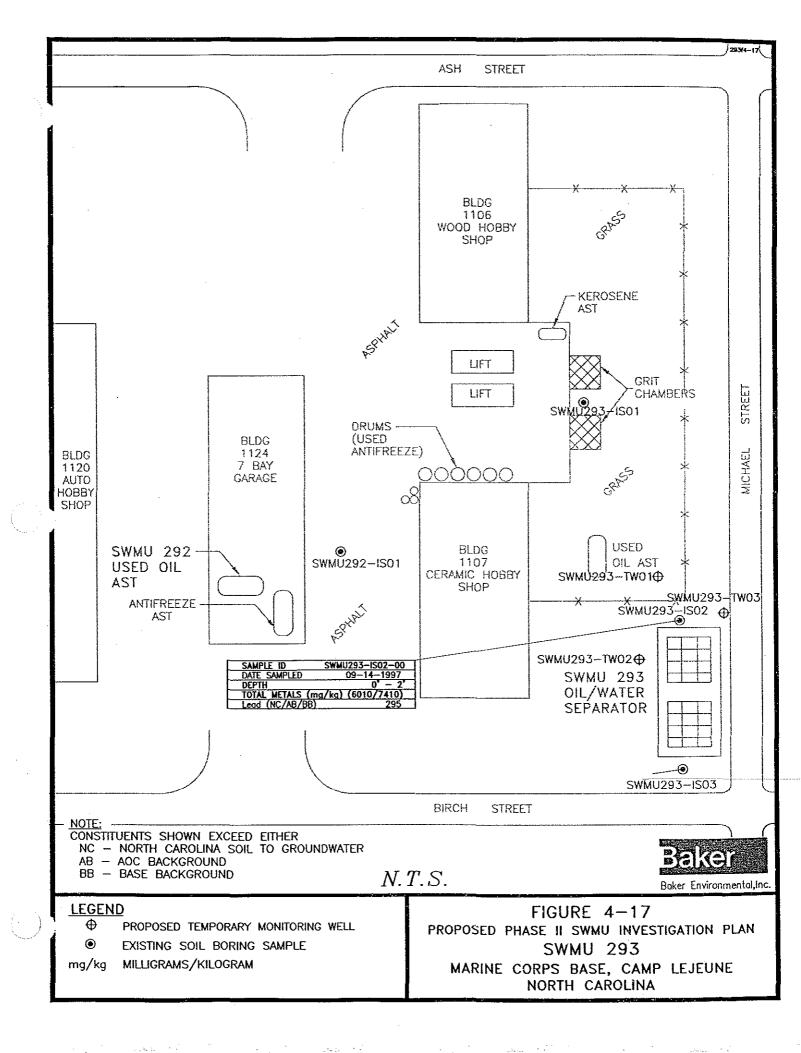
¹ Use additional sheets if necessary.
2 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

HPIA

HP1124







Site Name:	S 1124	
Site Number:		

PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

Name and Title of Inspector:	Date: Time:
Site Location/Address: HPIA, Building S	-1124 located South of build
Site Location/Address: HPIA, Building S in the centur block of BIRCH, HALLA Approximate Area of Site (acres or square feet): A	OND + ASH Streets.
1 story = ~3, 600 sg. 6+.	
Direction to Site (from nearest public road):	· · · · · · · · · · · · · · · · · · ·
	·
Name and Position of Site Contact:	
Telephone Number:	
Weather Conditions:	
Describe Surrounding Land Use North:	dustrial
Adjacent to the Site South:	
East:	
West:	
Present Uses of Site: Agricultural	Commercial
Industrial	Undeveloped
Residential	
	~
Describe use. Partial Concud Storage	? These are open bays
Exchange Service Station?	•

Indicates Field/Record Search Task

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		Site Number:	
Former Uses of Site	e: Agricultural Industrial Residential		ommercial Indeveloped
Describe uses and le	engths of time. 1970-10	977 Constructed, Aus Jim	to Repair Shop
materials utilized.	al and commercial uses, des		
	wner or Tenants enants Typ		Length of Time Used
Describe the number (page 22).	er, size, shape, and use of ex	xisting structures. Indica	ate locations on site ske

ivironmental permits:		•
Туре	Agen	Expiration Date
escribe any emergency o	r remedial actions that h	ave occurred at the site.
ource of information:		
	data and briefly summar lical methods, detections	ize data quality (e.g., sample objective, limits and QA/QC).
Su HP1128-SA	ME. There is a	SWHU next to building
The SWMU #2	92 is a vehicle	SWMU next to building a wash rack (See figure)
#22	3 (sil/Water Sep.)	(5 06-5)
aste Water Managemen	t:	
Onsite Septic Syster	n: Domestic Yes	No
	Industrial Yes	No
Onsite Septic System Public Sewer:	n: Domestic Yes Industrial Yes Domestic Yes Industrial Yes	No No
Public Sewer:	Industrial Yes Domestic Yes Industrial Yes	No No No
Public Sewer:	Industrial Yes Domestic Yes	No
Public Sewer: Name of Agency: _	Industrial Yes Domestic Yes Industrial Yes	No
Public Sewer: Name of Agency: Other:	Industrial Yes Domestic Yes Industrial Yes	No
Public Sewer: Name of Agency: _	Industrial Yes Domestic Yes Industrial Yes	No
Public Sewer: Name of Agency: Other:	Industrial Yes Domestic Yes Industrial Yes er treatment systems.	No No No No Contact Person Phone Number
Public Sewer: Name of Agency: _ Other: escribe onsite wastewate	Industrial Yes Domestic Yes Industrial Yes er treatment systems.	No No No Contact Person Phone Number
Public Sewer: Name of Agency: _ Other: escribe onsite wastewate	Industrial Yes Domestic Yes Industrial Yes er treatment systems.	No No No Contact Person Phone Number
Public Sewer: Name of Agency: _ Other: escribe onsite wastewate	Industrial Yes Domestic Yes Industrial Yes er treatment systems.	No No No Contact Person Phone Number
Public Sewer: Name of Agency: _ Other: escribe onsite wastewate	Industrial Yes Domestic Yes Industrial Yes er treatment systems.	No No No Contact Person Phone Number

Site Name:		
Site Number:		

WASTE CHARACTERISTICS

* Describe underground tanks onsite and identify on site sketch.

	SEE HF	1/20- SI	OME: S		Leak Detection/	
Tank ID	Type and Capacity	<u>Contents</u>	Age	Location	Secondary Containment	Registered Y N
				<u> </u>	<u> </u>	
						
						•

* Describe underground hazardous material piping systems at the site and identify on site sketch.

Location	Type of Pipe	Age	Type of <u>Hazardous Material</u>
		e .	·
	· · · · · · · · · · · · · · · · · · ·		

X

Describe aboveground tanks onsite and identify on site sketch.

Tank ID	Type and Capacity	Contents	_Age_	Location	Leak Detection/ Secondary Containment	Registered Y N N/A
					4	

Site Name: _	
Site Number:	

* Describe container storage areas and identify on site

Area ID	<u>Paved</u>	Containment	No., Size, and Type of Containers	Condition of Containers		Evider Rele
T * . 1					.	
List nazaro		als used onsite.		No. and S	Size of Conta	iners
					·	
		· · · · · · · · · · · · · · · · · · ·				
	us: N/A	Generator	TSD _	Transporte	г Реі	mitted IS
RCRA stat						
Describe tr	eatment, si	torage, and dispo	sal procedures			
Describe tr	eatment, si	egulated units.	sal procedures	for hazardous w		
Describe tr	eatment, si	egulated units.		for hazardous w		

			<u> </u>
		Site Number:	
Stressed Vegetation:			•
	Areal Size	Nature of Stress	Sourc
	· · · · · · · · · · · · · · · · · · ·		
		<u> </u>	
		· · · · · · · · · · · · · · · · · · ·	
Odors:			
	Desc	ription	Source
Document of Occurrence		- Inpition	Source
			* ************************************
			
			* '
Transformers:		•	
Manufact	turer		
ID Numb		<u> </u>	***************************************
	4505111		
ATESCHEE	TO THE PARTY OF TH		
Fluorescent Light Ballasts:			
-	Presence of "No	PCB" labels	
	Yes 1	Vo	
			
Describe onsite debris and/o	r trash disposal are:	as:	
Area ID or Location		Contents	
	***************************************		***************************************
Describe any restrictions or l	barriers on accessibi	ility to onsite waste mater	ials:
•	barriers on accessib	ility to onsite waste mater	ials:
•		ility to onsite waste mater	ials:
•		ility to onsite waste mater	ials:
•		· .	ials:
· · · · · · · · · · · · · · · · · · ·		· .	ials:

Site Name: _	_
Site Number:	 -

WASTE SOURCE SUMMARY

Complete this portion of the checklist only after all available current and historic waste characteristics data have been gathered through the field reconnaissance and record search. Table 1 is designed to help you delineate site sources for scoring purposes.

For each source at the site, summarize in Table 1 (page 25):

- 1. Source Name
- 2. Source Type (according to Source Type Descriptions in PA Guidance, page A-6)
- 3. Size/volume/area of all features/structures that might contain hazardous waste
- 4. Estimated waste quantity as measured onsite or from record search
- 5. Types of hazardous substances handled
- 6. Condition/integrity of each storage disposal feature or structure
- 7. Sources of information for current site conditions and historical site conditions

	 <u> </u>	 method and ra	
			į.
-			

	Site Number:
GROUNDWATER PATHWAY	
	Park and only
Groundwater at Site: (identify depth, quality, gr	
Depth to groundwatu is approx. 1 east to west across Site 78.	Thue is a LUCIP on Site To
In Table 2 (page 26), give names, descriptions, a units underlying the site.	
Number of onsite drinking: and monitorsketch (page 22).	ring: wells. Show locations on site
Obtain boring logs and well completion diagrams	if available.
Source of Site Drinking Water:	
Bottled Water: Yes No	
Wells Onsite: Yes No	
Public Water Supply: Yes No	
Name of Agency:	Contact Person;
Other:	Phone Number:
Any positive on singularity and and of a release	
Any positive or circumstantial evidence of a relea	-
Describe:	
Source of information:	*.
ls a release to groundwater from current or histo the following criteria and describe.)	ric sources suspected? (Base this judgment on
Are sources poorly contained?	
12	groundwater contamination (e.g., wet lagoon)?
Is the infiltration rate high?	

		Site Name		
		Site Numb	er:	
Is the site locate	ed in an area of karst	terrain?	refu to	RI
	e highly permeable or			
Is drinking wate	er drawn from a shallo	w aquifer?		
Are suspected co	ontaminants highly mo	bile in groundwa	ter?	
Does analytical	or circumstantial evide	ence suggest grou	ndwater contan	hipation?
Other criteria?				Υ
			······	,
	5 5 5 5 1			
		· · · · · · · · · · · · · · · · · · ·		
ibe.)	-			owing criteria an
ibe.)	-			-
ibe.)	water targets exist? water well nearby? drinking water well be			-
ibe.) Is any drinking Has any nearby	-	NO, ly	n to RI,	ucip
ibe.) Is any drinking Has any nearby Has any nearby	water well nearby?	NO, Ly een closed?	ァかれ,	UCIP
ibe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking	water well nearby?	WO, Ly een closed? eported foul-tasti wdown or high proceed the site and	ng or foul-sme roduction rate?	UCIP
ibe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking exposed to a ha	water well nearby? drinking water well be drinking water user re y well have a large dra water well located bet	WO, Ly een closed? eported foul-tasti wdown or high proceed the site and	ng or foul-sme roduction rate?	lling water?
ibe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking exposed to a har	water well nearby?	NO, Ly een closed? ported foul-tasti wdown or high pr ween the site and ence suggest conta	ng or foul-sme oduction rate? other wells the	Illing water?at are suspected a
ibe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking exposed to a har Does analytical Does any drinkin	water well nearby?	een closed?eported foul-tastice wdown or high provided the site and ence suggest contacts ampling?	ng or foul-sme roduction rate? other wells the	Illing water?at are suspected a
ibe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking exposed to a har Does analytical Does any drinkin	water well nearby? drinking water well be drinking water user re y well have a large drawater well located bet zardous substance? or circumstantial evident water well warrant	WO, Ly een closed? ported foul-tasti wdown or high pr ween the site and ence suggest conta	ng or foul-sme roduction rate? other wells the	Illing water?at are suspected a
ibe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking exposed to a har Does analytical Does any drinkin	water well nearby?	WO, Ly een closed? ported foul-tasti wdown or high pr ween the site and ence suggest conta	ng or foul-sme roduction rate? other wells the	Illing water?at are suspected a
ibe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking exposed to a har Does analytical Does any drinkin	water well nearby? drinking water well be drinking water user re y well have a large dra water well located bet zardous substance? or circumstantial evide	WO, Ly een closed? ported foul-tasti wdown or high pr ween the site and ence suggest conta	ng or foul-sme roduction rate? other wells the	Illing water?at are suspected a

	Site Name:	
	Site Number:	
Determine the locations suspect have been exposed to the contract of the contr	s of and the number of people served by drinking water wells tha sed to hazardous substances from the site.	t you
		
Discuss granndwater ns	age within four miles of the site.	
Discuss groundwater as	age within rout miles of the site.	
		-,
Source of information:		
Summarize the populat	ion served by groundwater in the table below as measured from t	he outer
most boundary(ies) of	the source(s) to drinking water supply wells. Provide apportionm (page 27) if applicable.	ent
calculations in Table 5	(page 27) if applicable.	
Distance		
<u>(miles)</u>	Population	
0 - 1/4		
1/4 - 1/2		
1/2 - 1		
1 - 2		
2 - 3		
3 ~ 4		
·		
Source of information:		
What is the distance to	the nearest drinking water well?	
•	See RI or LUCH	
Are any wellhead prote	ction areas present within 4 miles of the site?	
	•	

irrigation, commercial l	rom wells within 4 miles of the site used for commercial food/folivestock water, ingredient in commercial food preparation, supply, or supply for a major water recreation area? Specify.	rage crop y for

	Site Number:
CYNDRICE WATER DATEWAY	
SURFACE-WATER PATHWAY	
	hat could potentially receive runoff from the site.
Nearest Surface water	bedies are Beaun Dam, Codgels Cruka
New River.	
Discuss the probable surface runoff	patterns from the site to surface waters.
<u>-</u>	
heath Endin during 4	the RI.
- January	
Provide a simplified sketch of surfactors and surfactors are miles (page 23). Identify wh	ce runoff and the surface-water flow system for 15 down- hich water courses are overland, intermittent, or perennial.
Determine the average annual strean	m flow of downstream surface water for 15 downstream miles.
Water body:	cfs
Water body:	Flow: cfs
Water body:	Flow: cfs
Water body:	
Water body:	cfs
Source of information:	
Describe and locate on the surface w (PPE) of potential hazardous substan	water features map (page 23) the probable point of entry ince into a perennial water body.
(if part of the migration pathway is	distance from any source to a perennial surface-water body via intermittent drainages, include these drainages as part of the course of water flow, not a straight line).
s the site or portions thereof located $\mu \sigma$	d in surface water?
What is the site flood frequency?	
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Site Name:			·
Site Number:		щ	

Any positive or circumstantial evidence of surface-water contamination from current or historic sources? (Base this judgment on the following criteria and describe.)

X	*	Is surface water nearby?
, .	*	Is waste quantity particularly large?
	*	Is the drainage area large?
		Is rainfall heavy?
		Is the infiltration rate low?
	*	Are sources poorly contained or prone to runoff or flooding?
X	*	Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
*	- *	Is vegetation stressed along the probable runoff route?
*	¥	Are sediments or water unnaturally discolored?
	*	Is wildlife unnaturally absent?
	*	Has deposition of waste into surface water been observed?
	*	Is groundwater discharge to surface water likely?
	¥	Does analytical or circumstantial evidence suggest surface-water contamination?
	*	Other criteria?
		Do any primary surface-water targets exist? (Base this judgment on the following criteria and describe.)
	*	Is any target nearby? If yes, specify below:
	*	Drinking water intake
	*	Fishery
	*	Sensitive environment
		Densitive curricument

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	Site Number:
\ ₁₁	as any intake, fishery, or recreational area been closed?
	oes analytical or circumstantial evidence suggest surface-water contamination at or ownstream of a target?
D	oes any target warrant sampling? If yes, specify below:
	Drinking water intake
444	Fishery
	Sensitive environment
· · O	ther criteria?
P	rimary intake(s) identified?
P	rimary fisher(ies) identified?
P	rimary sensitive environment(s) identified?
Source	of information:
Are any vells si	y intakes part of a blended water supply system, and if so, how many other intakes or upply the same system?
Vhat is	the distance to the nearest drinking water intake?
Describ	e and locate fisheries within 15 downstream mHes of the site.
	
Source	of information:

	Site Name:
	Site Number:
Describe any sensitive en stream miles of the site.	evironments (PA Guidance, PA Table 5, page A-31) within 15 down-
-	
Measure the total length stream mile target distar	(or frontage) of wetlands adjacent to surface water along the 15 down- ace limit of the site.
Thre are	not we stands with site 78 (Baku. 1994)
- ALIFALE A	

•	Site Number:
SOIL EXPOSURE PATHWAY	
Describe known surficial (within 2 feet of surf site.	ace) areas of contamination on or adjacent to
* Visual evidence of run-on/runoff?	Yes No
* Visual signs of contaminated run-on/runoff?	Yes No
Description and direction of site runoff:	
Surface-water run-on from neighbor's propert	y (identify source directions and contamination
Surface-water run-on from neighbor's propert potential). Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facil	y (identify source directions and contamination exposure pathway can be identified on the basety on or within 200 feet of an area of suspect
Surface-water run-on from neighbor's propert potential). Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facil contamination? Is any residence, school, or daycare facil	y (identify source directions and contamination exposure pathway can be identified on the basity on or within 200 feet of an area of suspecting located on adjacent land previously owned
Surface-water run-on from neighbor's propert potential). Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facil contamination? Is any residence, school, or daycare facil leased by the site owner/operator? Is there a migration route that might spreador.	y (identify source directions and contamination exposure pathway can be identified on the basety on or within 200 feet of an area of suspect
Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facilicantamination? Is any residence, school, or daycare facilileased by the site owner/operator? Is there a migration route that might sproor daycare facilities? Have onsite or adjacent residents or students.	exposure pathway can be identified on the base ty on or within 200 feet of an area of suspected ty located on adjacent land previously owned ead hazardous substances near residences, school
Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facil contamination? Is any residence, school, or daycare facil leased by the site owner/operator? Is there a migration route that might sproor daycare facilities? Have onsite or adjacent residents or study apparent drinking water or air contamination.	exposure pathway can be identified on the base ty on or within 200 feet of an area of suspected ty located on adjacent land previously owned ead hazardous substances near residences, schools reported adverse health effects, exclusive

Site Name:
Site Number:
Resident population identified?
Determine the number of people occupying residences or attending school or daycare on or with 200 feet of areas of suspected contamination.
Is the facility active?
If yes, how many workers?
How many workers are employed at offsite facilities with suspected contamination?
Describe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) on an aroof suspected contamination.
Are commercial agriculture, commercial silviculture, commercial livestock production, or commercial livestock grazing present on areas of suspected contamination? Specify.
Determine the population (those who live, work, or attend school) within 1 mile of suspected

Site Name: _	
Site Number:	

AIR PATHWAY



Describe current or historic sources for which migration of hazardous substances to the air pathway could occur.

*

Is a release of hazardous substances to the air pathway suspected? (Base judgment on the following criteria and describe.)

Are odors currently reported or have they been reported in the past?

Has release of a hazardous substance to the air been directly observed?

Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?

Does analytical or circumstantial evidence suggest a release to the air?

Other criteria?

Suspected release?

*

Summarize the population within a four-mile radius of the site.

Distance	
(miles)	Population

- * Onsite
 - 0 1/4
 - 1/4 1/2 _______
 - 1 2
 - 2 3
 - 3 4

	Site Name:
	Site Number:
Determine the distance from the outer hour	ndary of the sources available to the air pathway to
	can be a worker, resident, or student. Measure from
ne outer boundary or an sources to the ou	nuing occupied by the hearest individual.)
dentify and locate any sensitive environme o 1/4 mile and 1/4 to 1/2 mile of the site.	ents (PA Guidance, PA Table 5, page A-31) within 0
o 1/4 mile and 1/4 to 1/2 mile of the site.	•

	Site	Number:	
General Comments			
Describe any additional information chis space to document any assumptions.	collected and clarif ons made for scorin	y any issues previo g purposes, and th	ously addressed. Use e rationale behind
			· · · · · · · · · · · · · · · · · · ·
And the second and the second field in the second s			
<u> </u>			
	<u> </u>		

	·		

REFERENCES

Baker. June 1994. Final Remed	ial Unives	tisations	Lorous.
	_	3. ()
Jim Dolph. Historical Report			
		.	
			- <u> </u>
		<u></u>	
		,,,	
		·	
			

INTERVIEWS				* *
Table 1				
			·	
				
				
	,	-		-
				
		·		
			-,	
		-		
			,, <u>,</u>	
			· 	·
				

Site	Name:		 	 _
Site	Numbe	r:	 	_

Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.

	N †
•	

Site Name: _	
Site Number:	

Surface-Water Features

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

		N †
	• *	
		·
 ·		
	•	

ite	Name: _	
ite	Number:	

X

Photo Log

Photo Number Description of Location

Looking Which Direction

Comments

	Source	Source Type	Size	Estimated			Sources of I	nformation
L	Name	Source Type (PA Guidance, page A-6)	(volume/area)	Waste Quantity	Specific Compounds	Containment ²	Current	Historical
			,					,

Use additional sheets if necessary.
 Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

Table 2: Hydrogeologic Information¹

Strata Name/Description	Thickness (feet)	Mydraulic Conductivity (cm/sec)	Type of Discontinuity ²	Source of Information
	·			

¹ Use additional sheets if necessary.
2 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

Table 3: Apportionment Calculations for Drinking Water Wells¹

				·····			····
Distance Category (miles)	Well Number	Well Name	System	Population Served by System	Total Wells Supplying System	Population Served by Well	Total Population Served for Distance Category
0 - 1/4							
1				•			
1/4 - 1/2							

1/2 - 1							
		-				- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	
1 - 2							
1							
İ							
}					,		
2 - 3				· · · · · · · · · · · · · · · · · · ·			
3 - 4							
	· · · · · · · · · · · · · · · · · · ·						
 				L		 	

¹ See PA Guidance, pages 63 and 64 for additional guidance on apportionment,

HPIA

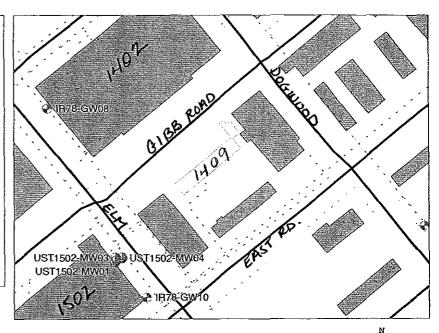
HP1409

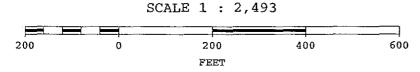
Lejeune PA Site, Building HP1409

Water Line
Wastewater Line
Storm Sewer

IR Wells Shallow Aquifer
IR Wells Castle Hayne Aquifer
Recovery Wells Shallow Aquifer
Recovery Wells Castle Hayne Aquifer
UST Wells Shallow Aquifer
'T Wells Castle Hayne Aquifer
Major Roads
Minor Roads
Buildings

IR Sites (Wells available at 1:35,000)







Site Name: _	HP	1409	
Site Number:			

PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

SITE INFORMATION	-
Name and Title of Inspector:	
Site Location/Address: HPIA, located in the ELM, and Enot Rd. Building Approximate Area of Site (acres or square feet): Build 1 Stry = ~5,4005q.ft.	centu bluck of Gibb Rd, Dosw 1409 within IR Site 78. diny approx-length 180'X width
Direction to Site (from nearest public road):	
Name and Position of Site Contact:	
Telephone Number:	
Adjacent to the Site South:	strial
Present Uses of Site: Agricultural Industrial Residential	Commercial Undeveloped
Describe use. Currently, a military boas	t Shop. Small boats are rep
Indicates Field/Record Search Task	

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Described Loss of the second	stery and ling classe	egths of time	Agricultural Industrial Residential e. 1943-Constructor Shop. 1959 blic wake Sta	cted, Stor	Commercial Undeveloped asc Building 19405 minatim building.
Described Loss of the second	e uses and len Stery and Ling. Classe mer industrial	egths of time	Industrial Residential e. 1943-Constructor Shop. 1959 blic wake stu	- diconta	Undeveloped Take Building. 1940: mination building.
For formaterial Circustrip Is site u Describe (page 22)	Stery and uny classe mer industrial	Carpins	blic wake stu	- diconta	mination building.
For formaterial Circus Shrip Is site u Describe (page 22)	<i>ling. Classr</i> mer industrial	oum, pu	blic wake stu	- diconto	nination building.
For formaterial Circus Shrip Is site u Describe (page 22)	mer industrial			ray + far	
Is site u Describe (page 22)		l and comme	watal wasa Jaaratta 4		nitur repair.
Describe			erciai uses, describe t	types of process	ses and hazardous
Describe	ularSau	a, grinc	lus, beat ing	ine repair	related tools, pain
Describe	oper, hyd	traulic	fluid, pinet	rating flu	telated tuols, pain
Describe	•			•	
Describe	ised by Owi	ner	or Tenants	_	
(page 22	Name of Ten	ants	Type of U	<u>se</u>	Length of Time Used
(page 22			4		
(page 22					
(page 22					·
(page 22					
		, size, shape	, and use of existing	structures. In	dicate locations on site sketc
	Bleek Bibb	· .			
		,			
Site Ho		Good:	Average:	Poor:	
Describe	ousekeeping:		n.		
/	ousekeeping: e Housekeepi	ng Conditio	 -		

nvironmental permits: Type	 -	Agency		Ex	cpiration Date	
			·			
Describe any emergency or	remedial act	tions that have o	occurred at	the site.		
Source of information:						
Discuss existing sampling da age/comparability, analytic					ıple objective,	,
іде/ сошрагарингу, анагуыс	ai methous,	detections limit	s and QA/C	ĮСJ.		
Is The willows	h	illia n		1	AL HET SI	·L.
No IR willo Ma	s Heb	ulding. Th	urisa	form	W UST SI	ti
No IR wells near building 1502 son	r Hibi Ahuus	uilding. The	urisa.	form	W UST SI	te
No IR willo Ma building 1502 Son	n Hibi Ahuus	ulding. The	usina.	frmi	W UST SI	tı
V	s Huss	uilding. The	urisa.	frmi	W UST SI	tı
V	Domestic		No		W UST SI	tu
Waste Water Management:	Domestic Industrial	YesYes	No		W UST SI	ta
Waste Water Management: Onsite Septic System:	Domestic Industrial Domestic Industrial	Yes Yes Yes Yes	No No No		W UST SI	
Public Sewer:	Domestic Industrial Domestic Industrial	Yes Yes Yes Yes	No No No Contact F	Person		
Waste Water Management: Onsite Septic System: Public Sewer: Name of Agency: Other:	Domestic Industrial Domestic Industrial	Yes Yes Yes Yes	No No No Contact F	Person		
Waste Water Management: Onsite Septic System: Public Sewer: Name of Agency:	Domestic Industrial Domestic Industrial	Yes Yes Yes Yes Yes Yes Yes	No No No Contact F	erson	·	

3.

FORMS(6) - Fld-Insp 0402041492 Site Name: __ Site Number:

•				Dive Rume		
				Site Number: _		
-	ARACTERIST			sito alkotak	That are of	being stud ST Section
	-	cs onsite and id	-		. 6	
pone di	rictly on	site, but	these of	ue reac	Leak برخ Detection	<i>(</i>
	Type and				Secondary	Registered
Tank ID		Contents		_		
		prise				
	550sul	Waste Oil Gassin		1502-1		
· · · · · · · · · · · · · · · · · · ·	<u>560 sul</u>	Gasoline		1502-2		
					-	
escribe und	derground haza	ardous materia	l piping sy	stems at the si	ite and identify o	on site sketch.
	derground haza	T	I piping sy: ype Pipe	Age	Туре	of
L	ocation	T	ype Pipe	_Age	Туре	of
L	ocation	of T	ype Pipe	_Age	Type Hazardous l	of
L Describe abo	ocation oveground tank	of of of one of the contract o	ype Pipe 	Age	Type Hazardous l Leak Detection/ Secondary	of Material Registered
L Describe abo	ocation oveground tank	of of of one of the contract o	ype Pipe 	Age	Type Hazardous l Leak Detection/ Secondary	of Material Registered
L Describe abo	ocation oveground tank	of of of one of the contract o	ype Pipe 	Age	Type Hazardous l Leak Detection/ Secondary	of Material Registered

Area ID Pave	d Containment		Condition of Containers		Evidence Release
			•		
	<u> </u>				

List hazardous ma	terials used onsite.				
N-	ame of Material		No and 9	Size of Conts	inare
	anc or material			Size of Conta	HIREIS
- feels / -	4				
				•	
			**		
			·		
RCRA status: N/	A Generator t, storage, and dispo	TSD _	Transporte	er Per	rmitted ISD
RCRA status: N/ Describe treatmen identify any RCR	A Generator t, storage, and dispo A-regulated units.	TSD _	Transporte	er Per	rmitted ISD
RCRA status: N/	A Generator t, storage, and dispo A-regulated units.	TSD _	Transporte	er Per	rmitted ISD
RCRA status: N/ Describe treatmen identify any RCR	A Generator t, storage, and dispo A-regulated units.	TSD _	Transporte	er Per	rmitted ISD
RCRA status: N/ Describe treatmen identify any RCR	A Generator t, storage, and dispo A-regulated units.	TSD _	Transporte	er Per	rmitted ISD
RCRA status: N/ Describe treatmen identify any RCR	A Generator t, storage, and dispo A-regulated units.	TSD _	Transporte	er Perastes genera	rmitted ISD
RCRA status: N/ Describe treatmen	A Generator t, storage, and dispo	TSD _	Transporte	er Perastes genera	rmitted ISD

Stressed Vegetation: <u>Location</u>	Areal Size	Nature of Stress	Source
Odors: Location of Occurrenc	ee Desc	eription	Source
Transformers:			
Manufa TD Norm			
ID Num Presenc	e of PCB labels		
Fluorescent Light Ballasts:	Presence of "No	PCB" labels	
	Yes	No	
Describe onsite debris and/	or trash disposal are	as:	
Area ID or Locatio	<u> </u>	Contents	
Describe any restrictions or	r barriers on accessib	ility to onsite waste mater	ials:
FENCED COMO	um)	inh finit kyrajny co	
Describe any signs of unau	thorized human activ	itv.	
	LIIVLIZCU RUMAH ACUY	**j*	

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	Site Name:
	Site Number:
WASTE SOURCE SUMMARY	\cdot
Complete this portion of the checklist only after all characteristics data have been gathered through the Table 1 is designed to help you delineate site source	e field reconnaissance and record search.
For each source at the site, summarize in Table 1 (1	page 25):
1. Source Name	
2. Source Type (according to Source Type De	scriptions in PA Guidance, page A-6)
3. Size/volume/area of all features/structures	s that might contain hazardous waste
4. Estimated waste quantity as measured onsi	te or from record search
5. Types of hazardous substances handled	
6. Condition/integrity of each storage dispose	al feature or structure
7. Sources of information for current site con	editions and historical site conditions
In the space below provide any additional information and quantification (e.g., when waste source data is high for conservative scoring purposes, documentat	limited and the waste quantity is estimated

		Sit	te Number:
C. O. O. O. O. O. O. O. O. O. O. O. O. O.			
<u>GROUNDWATER PATHWAY</u>	Y		,
Groundwater at Site: (identif			
Depth to Soundwat	u is a	pru - 10	(+ bgs. and flow is generally east
to mest acrossiffe se	te 78.	LUCIPM	of bys. and flow in generally east yourself water.
In Table 2 (none 26) sive no		tions and ab	aracteristics of geologic/hydrogeologic
unite underlying the cite			
	2		Sufisher
Number of onsite drinking: _sketch (page 22).	(<u>O</u> and	d monitoring:	wells. Show locations on site
Obtain boring logs and well c	ompletion (diagrams if av	ailable.
Source of Site Drinking Wate	r:		
Bottled Water:	Yes	No	
Wells Onsite:	Yes	No	
Public Water Supply:	Yes	No	
Name of Agency:			Contact Person;
Other:			Phone Number:
Any positive or circumstantia	I evidence o	of a release to	groundwater?
Describe:			
Source of information:		٠,	
Is a release to groundwater for the following criteria and des		t or historic so	ources suspected? (Base this judgment on
Are sources poorly cont	ained?		
• -	_	_	dwater contamination (e.g., wet lagoon)?
is the militration rate	mgn:		

	Site Name:
	Site Number:
I	s the site located in an area of karst terrain?
I	s the subsurface highly permeable or conductive?
Į	s drinking water drawn from a shallow aquifer?
A	are suspected contaminants highly mobile in groundwater?
Ι	oes analytical or circumstantial evidence suggest groundwater contamination?
	Other criteria?
_	
_	
	s any drinking water well nearby?
	Has any nearby drinking water user reported foul-tasting or foul-smelling water?
Ι	Has any nearby drinking water user reported foul-tasting or foul-smelling water?
I	Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? It is any drinking water well located between the site and other wells that are suspected to a hazardous substance?
I I e	Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? It is any drinking water well located between the site and other wells that are suspected to a hazardous substance?
I E e T	Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? It is any drinking water well located between the site and other wells that are suspected to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water well.
I e r	Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? It is any drinking water well located between the site and other wells that are suspected to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water wells.
E E	Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? It is any drinking water well located between the site and other wells that are suspected to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water w
I e r	Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? It is any drinking water well located between the site and other wells that are suspected to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water w

	Site Name:
•	Site Number:
Determine the locations suspect have been expos	of and the number of people served by drinking water wells that you sed to hazardous substances from the site.
· · · · · · · · · · · · · · · · · · ·	
Discuss groundwater usa	age within four miles of the site.
	<u> </u>
Source of information:	
Summarize the populati most boundary(ies) of the calculations in Table 3	on served by groundwater in the table below as measured from the outer he source(s) to drinking water supply wells. Provide apportionment (page 27) if applicable.
Distance (miles)	Population
0 - 1/4	
1/4 - 1/2	
1/2 - 1	
I - 2	
2 - 3	
3 - 4	
Source of information:	
	the nearest drinking water well?
	the nearest drinking water well? Su RI or MUIP
What is the distance to	
What is the distance to	Su RI Or MULIP
What is the distance to Are any wellhead protection Is groundwater drawn frigation, commercial I	Su RI Or LUCIP
Are any wellhead protection of the design of	ction areas present within 4 miles of the site? rom wells within 4 miles of the site used for commercial food/forage cropivestock water, ingredient in commercial food preparation, supply for

•	Site Number:
SURFACE-WATER PATHWAY	
	could potentially receive runoff from the site.
	•
+ New River.	bodies ou Beauce Dam, Codgels Cru
- New River	
Discuss the probable surface runoff pat	tterns from the site to surface waters.
Surface water a Sed s	amples for the above mentioned has
bun Naken during the	RI.
· ·	
	runoff and the surface-water flow system for 15 down- water courses are overland, intermittent, or perennial.
	low of downstream surface water for 15 downstream miles.
Water body:	Flow: cfs
Water body:	flows cfs
S	
Source of information:	
Describe and locate on the surface water (PPE) of potential hazardous substance	er features map (page 23) the probable point of entry e into a perennial water body.
(if part of the migration pathway is via	tance from any source to a perennial surface-water body intermittent drainages, include these drainages as part of ecourse of water flow, not a straight line).
Is the site or portions thereof located in	n surface water?
What is the site flood frequency?	
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Site Name:	
Site Number:	_

Any posi	tive or circumstantial evidence of surface-water contamination	from	current e	or l	historic
sources?	(Base this judgment on the following criteria and describe.)				

*	*	Is surface water nearby?
	•	Is waste quantity particularly large?
	*	Is the drainage area large?
-		Is rainfall heavy?
		Is the infiltration rate low?
*	*	Are sources poorly contained or prone to runoff or flooding?
*	*	Is a runoff route well defined (e.g., ditch or channel leading to surface water)? YES
*	*	Is vegetation stressed along the probable runoff route?
	*	Are sediments or water unnaturally discolored?
	*	Is wildlife unnaturally absent?
	*	Has deposition of waste into surface water been observed?
·	*	Is groundwater discharge to surface water likely?
	*	Does analytical or circumstantial evidence suggest surface-water contamination?
	*	Other criteria?
		any primary surface-water targets exist? (Base this judgment on the following criteria and scribe.)
	* ·	Is any target nearby? If yes, specify below:
	*	Drinking water intake
	*	Fishery
	*	Sensitive environment

	Site Number:
Has any intake, fishery, or recreational a	rea been closed?
	e suggest surface-water contamination at or
Does any target warrant sampling? If yes	
Drinking water intake	
Fishery	
Sensitive environment	
Other criteria?	
Primary intake(s) identified?	
Primary fisher(ies) identified?	
Primary sensitive environment(s) identifie	ed?
ource of information.	
are any intakes part of a blended water supply vells supply the same system?	system, and if so, how many other intakes or
What is the distance to the nearest drinking wa	ter intake?
escribe and locate fisheries within 15 downstr	ream miles of the site
Describe and locate fisheries within 15 downstr	ream miles of the site.
Describe and locate fisheries within 15 downstr	ream miles of the site.
Describe and locate fisheries within 15 downstr	ream miles of the site.
Describe and locate fisheries within 15 downstr	ream miles of the site.
Describe and locate fisheries within 15 downstr	

	Site Name:
	Site Number:
Describe any sensitive environments (PA Guidance tream miles of the site.	re, PA Table 5, page A-31) within 15 down-
Measure the total length (or frontage) of wetland tream mile target distance limit of the site.	is adjacent to surface water along the 15 down-
There are no autlands whi	n Sik 78 (Baku. 1994).

SOIL EXPOSURE PATHWAY			
Describe known surficial (within 2 feet of surf site.	ace) areas of con	amination on o	r adjacent to the
	<u> </u>		
			<u> </u>
* Visual evidence of run-on/runoff?	Yes	No	.
* Visual signs of contaminated run-on/ runoff?	Yes	No	
Description and direction of site runoff:			
			-
C. for an additional form of the control of the con	(: J 4:6	J:	
Surface-water run-on from neighbor's propert potential).	y (identity source	directions and	contamination
governme).			
		-	·
Determine if a resident population for the soil the following criteria. Describe.	exposure pathway	can be identif	
Determine if a resident population for the soil	exposure pathway	can be identif	ied on the basis o rea of suspected
Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facil	exposure pathway	can be identiful of the control of t	ied on the basis o
Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facil contamination? Is any residence, school, or daycare facil	exposure pathway ity on or within 2 ity located on adj ead hazardous sul	can be identiful to the contract of the contra	ied on the basis or rea of suspected iously owned or esidences, schools
Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facily contamination? Is any residence, school, or daycare facily leased by the site owner/operator? Is there a migration route that might spr	exposure pathway ity on or within 2 ity located on adj ead hazardous sul	can be identiful to the contract of the contra	rea of suspected rously owned or esidences, schools
Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facilized contamination? Is any residence, school, or daycare facilized by the site owner/operator? Is there a migration route that might spror daycare facilities? Have onsite or adjacent residents or students.	exposure pathway ity on or within 2 ity located on adj ead hazardous sul ents reported adve	can be identiful to the contract of the contra	rea of suspected riously owned or esidences, schools, ects, exclusive of
Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facily contamination? Is any residence, school, or daycare facily leased by the site owner/operator? Is there a migration route that might spror daycare facilities? Have onsite or adjacent residents or studiapparent drinking water or air contamination.	exposure pathway ity on or within 2 ity located on adj ead hazardous sub- ents reported advention problems?	can be identiful to the contract of the contra	rea of suspected riously owned or esidences, schools,

•	Site Name:
	Site Number:
Resident population identified?	
	•
Determine the number of people occupying 200 feet of areas of suspected contamination	residences or attending school or daycare on or withi
200 feet of areas of suspected containination	ui.
	•
~ u a u . u a . 11 .	
Is the facility active?	
•	
If yes, how many workers? 20-30	O
How many workers are employed at offsite	e facilities with suspected contamination?
	·
Describe any terrestrial sensitive environment of suspected contamination.	ents (PA Guidance, PA Table 7, page A-39) on an ar
or suspected contamination.	
•	
Are commercial agriculture, commercial sil commercial livestock grazing present on ar	lviculture, commercial livestock production, or
	eas of suspected contamination: Specify.
<i>N</i> O	
Determine the nonulation (these who live	work, or attend school) within 1 mile of suspected
surficial contamination.	work, or attenu school, within 1 mile of suspected
	· · · · · · · · · · · · · · · · · · ·
•	

	Site Name:
	Site Number:
AIR	PATHWAY
Desc path	ribe current or historic sources for which migration of hazardous substances to the air way could occur.
-	
	release of hazardous substances to the air pathway suspected? (Base judgment on the wing criteria and describe.)
NC	Are odors currently reported or have they been reported in the past?
J	Has release of a hazardous substance to the air been directly observed?
	Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potential resulting from migration of hazardous substances through the air?
	Does analytical or circumstantial evidence suggest a release to the air?
	Other criteria?
	Suspected release?
Sum	marize the population within a four-mile radius of the site.
	Distance
	(miles) Population
	* Onsite

<u>(miles)</u>	<u>Population</u>				
* Onsite					
* 0 - 1/4					
1/4 - 1/2					
1/2 - 1					
1 - 2					
2 - 3					

	Site Name:
	Site Number:
the nearest individual. (Nearest individ	boundary of the sources available to the air pathway to lual can be a worker, resident, or student. Measure from building occupied by the nearest individual.)
Identify and locate any sensitive environ to 1/4 mile and 1/4 to 1/2 mile of the s	nments (PA Guidance, PA Table 5, page A-31) within 0 site.

	Site I	vame:	
	Site I	Number:	
General Comments			
Describe any additional information on the control of the control	ollected and clarify as made for scoring	any issues prev purnoses, and	viously addressed. Us the rationale behind
hose assumptions.		, Pri-Perre, and	·
			
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REFERENCES

Baker. June 1994. Linge Remedia	I Unvestigation for our No.1
Fim Dolph. Historical Search	
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INTERVIEWS						
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			ng at Norman			
		,				
		·				
						70

Site Name:	 _
Site Number:	

Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.

	 N †
	·
·	

Site Name:	
Site Number:	

Surface-Water Features

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

						N +
						‡
				÷		
L		•				

Site Name: ______Site Number: _____

*

Photo Log

_	Phot Numb		Description of Location	Looking Which Direction	Comments
542)	$ u^4$	1409	EAST	WEST SIDE
1	Z	1	1409	WEST	3AS 50E
V :A4.	3	10	1409	NO ROPE - WEST	1575 at 140?

	Source	Source Tune	Ciac	Totimotod			Sources of I	nformation
	Name	Source Type (PA Guidance, page A-6)	Size (volume/area)	Estimated Waste Quantity	Specific Compounds	Containment ²	Current	Historical
								,
		·						i
		*						
				_				
						:		
ĺ								
	4.5							
			:					
	,						•	
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			5					
							:	

Use additional sheets if necessary.
 Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

Table 2: Hydrogeologic Information¹

Strata Name/Description	Thickness (feet)	Hydraulic Conductivity (cm/sec)	Type of Discontinuity ²	Source of Information
			,	

¹ Use additional sheets if necessary.
2 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

Table 3: Apportionment Calculations for Drinking Water Wells¹

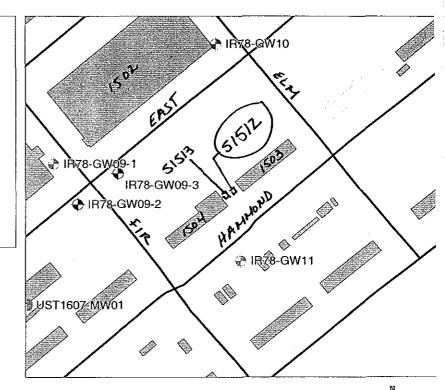
				,	· · · · · · · · · · · · · · · · · · ·	,	
Distance Category (miles)	Well Number	Well Name	System	Population Served by System	Total Wells Supplying System	Population Served by Well	Total Population Served for Distance Category
0 - 1/4							
1/4 - 1/2							
., 1 ., 2							
·						<u> </u>	
1/2 - 1							
		·				-	
1 - 2							
1 - 2							
•							
-							
2 - 3							
							·····
3 - 4							
		····					

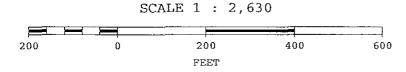
¹ See PA Guidance, pages 63 and 64 for additional guidance on apportionment.

HPIA HP1512

Lejuene PA Site Building HP1512

- R Wells Shallow Aquifer
- IR Wells Castle Hayne Aquifer
- Recovery Wells Shallow Aquifer
- ® Recovery Wells Castle Hayne Aquifer
- UST Wells Shallow Aquifer
- UST Wells Castle Hayne Aquifer
- Major Roads
- Minor Roads
- Buildings
- IR Sites (Wells available at 1:35,000)
 Investigation Site Boundary





Site Name: HP1512	
Site Number:	

PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

		Time:	
Site Location/Address: H	PIA, Building	HP1512 within IR	Site 78
Approximate Area of Site (a Maps The dimensions	cres or square feet): 1 www.apprw.25	Vo Structure located	hue, fro
Direction to Site (from near	est public road): /oco	ated in the centurbl	ochof Ed
Elm, Fir & Hamma	nd foado; betw	un Buildings 1504	land 150
<u> </u>		<u> </u>	
Name and Position of Site C	ontact:		
Telephone Number:			
Weather Conditions:			
Describe Surrounding Land	Use North Tr	dustrial	
Adjacent to the Site	South:	/	
			
	East:		·
	West:	<u>V</u>	· · · · · · · · · · · · · · · · · · ·
Present Uses of Site:	Agricultural	Commercial	
	Industrial	Undeveloped	:: L
	Residential		
			
Describe use. Currently ast likely an automo	there is no stru	where located here,	491512
, , , , ,	Luc A marks e	bruatus	

* Indicates Field/Record Search Task

	Site Nu	
Former Uses of Site:	Agricultural	Commercial
	Industrial	Undeveloped
	Residential	
Describe uses and langths of	time Minstruation	was most litelisan
A . na S. and tengths of	reaches a land	was most likely an y tanks, wash racketo to the supported on to
ble anich with the mai	town within Today	y faces are spired in t
Mary Mary Mary Mary	in history from the same	Jan Comment
For former industrial and co	mmercial uses, describe types	of processes and hazardous
materials utilized.		
s site used by Owner	or Tanante	
is site used by Offici	or renaits	
Name of Tenants	Type of Use	Length of Time Use
.,		
	nape, and use of existing struc	tures. Indicate locations on site
(page 22).		
page 22).		tures. Indicate locations on site
page 22). No Arectes		LUKETY AST OR LEES
page 22). No Arectes	-> 3517 WAS MOST	LUKETY AST OF LEES
page 22). Wo GREETER	> 5517 was most	LUKETY AST OR LEES
Describe Housekeeping Cond	> 5517 was most	LUKETY AST OF LEES

Туре	Agency		Expiration Date
•			
escribe any emergency or re	emedial actions that have	occurred at the site.	
		:	· •
ource of information:			
ge/comparability, analytica	l methods, detections limit	ts and QA/QC).	
iscuss existing sampling da ge/comparability, analytica lo IR or UST multo Surrending this t building 1502 wilding 1607	adjacent to the block. There is no , and two former	s and QA/QC). Site, however ne actine us UUST sites w	There are Sivera Tisite North of / west of 1512 at
se/comparability, analytically IR or UST mulbor Surrending This touilding 1502 mildings 1607	adjacent to the block. There is no , and two former	s and QA/QC). Site, however ne actine us UUST sites w	There are Sivera Tisite North of / west of 1512 at
se/comparability, analytically IR or UST multared This Surrending This toulding 1502 wildings 1607 waste Water Management: Onsite Septic System:	adjacent to the block. There is not and two formuland 1601.	s and QA/QC). Site, however ne active us UST sites a	There are Sivera Tisite North of / west of 1512 at
Surrending This Surrending This t building 1502 uildings 1607 aste Water Management: Onsite Septic System:	adjacent to the block. There is not have formed and 1601. Domestic Yes	s and QA/QC). Site, however ne active us UST sites a	There are Sivera Tisite North of / west of 1512 at
Jo IR or UST nulls Surrending this t building 1502 uildings 1607 faste Water Management: Onsite Septic System: Public Sewer:	block. Thur is not and two formula and 1601. Domestic Yes Domestic Yes	No No	There are Sivera Tisite North of / west of 1512 at
Surrending this Surrending this t building 1502 uilding 1607 faste Water Management: Onsite Septic System: Public Sewer:	Domestic Yes Domestic Yes Industrial Yes	No No No Contact Person _	There are Sivera Tisite North of / wist of 1512 at
Surrouding this The NST nulls Surrouding this The building 1502 Lildings 1607 aste Water Management: Onsite Septic System: Public Sewer:	Domestic Yes Domestic Yes Industrial Yes	No No No Contact Person _	There are Sivera Tisite North of / wist of 1512 at

Site Number: ___

a	
Site Number:	

WASTE CHARACTERISTICS

	lerground tank			te sketch. 7	nat are bu	my studied
none	directly	in the a	rea of	4P1512 reanea:	Leak Detection/	by UST section.
Tank ID	Type and Capacity	Contents	Age_	Location	Secondary Containment	Registered Y N
	500gul.	Used Oil		1607		NFA 2/1/
		Washoil		1502-1		NFA
	600gal.	Used Oil		1604/S-16/	<i></i>	NFA
-	_	Gasoline		1502-2		ActiveUST
·	1500sal	Used Oil	-	1601		TR progr.

* Describe underground hazardous material piping systems at the site and identify on site sketch.

Location	Type of Pipe	Age	Type of Hazardous Material
		-	-

. 1 /	•
* 1	Describe abovegroun

Describe aboveground tanks onsite and identify on site sketch.

Tank ID	Type and Capacity	Contents	Age	Location	Leak Detection/ Secondary Containment	Registered Y N N/A
	<u> </u>					
	-		·	· · · · · · · · · · · · · · · · · · ·		*****

Area ID Pay	ved Con	<u>tainment</u>	Containers	Condition of Containers	Contents	Evi R
1512	<u>/</u> _		73 TI	RES	copty_	
RCRA status: N	I/A	Generator	TSD _	Transporte	er Per	mitte
Describe treatme identify any RCI	ent, storage, RA-regulate	, and dispo				
RCRA status: N Describe treatme identify any RCI	ent, storage, RA-regulate	, and dispo		for hazardous w		

Stressed Vegetation: Location	Areal Size	40.48.48.48.4	Source
Odors: Location of Occurrenc	e Descr		Source
Transformers:	cturer		
ID Num Presence Fluorescent Light Ballasts:		PCB" labels	
Describe onsite debris and/ Area ID or Location		:	nts
Describe any restrictions or	barriers on accessibil	ity to onsite waste n	naterials:

	·	
	Site Name:	
. i	Site Number:	
WASTE SOURCE SUMMAR'	!	•
	-	
Complete this portion of the	hecklist only after all available current and h	istoric waste
characteristicadata have been	gathered through the field reconnaissance at	nd record search.
	u delineate site sources for scoring purposes.	
Table 1 is designed to help yo	a defineate site sources for scoring purposes.	
For each source at the site, si	mmarize in Table 1 (page 25):	
	•	
1 Source Name		

1. Source Name

- 2. Source Type (according to Source Type Descriptions in PA Guidance, page A-6)
- 3. Size/volume/area of all features/structures that might contain hazardous waste
- 4. Estimated waste quantity as measured onsite or from record search
- 5. Types of hazardous substances handled
- 6. Condition/integrity of each storage disposal feature or structure
- 7. Sources of information for current site conditions and historical site conditions

and quan	tification	(e.g., when	lata is limit	ed and the w	aste quanti:	ty is estimated s required):
			 	<u>.</u>		
			-		***************************************	
						
	-	-				

		e Number:
	•	
GROUNDWATER PATHWAY		
Groundwater at Site: (identify d	epth, quality, gradient	, and use)
Depth to grainduster.	· αρρικ. 10/1.	635. and flow is senerally ea
to aust across Site 78	LUCIP m 6	635. and flow is senerally ea
units underlying the site.		racteristics of geologic/hydrogeologic
Number of onsite drinking:	and monitoring: _	sufisme wells. Show locations on site
Obtain boring logs and well com	pletion diagrams if ava	ilable.
Source of Site Drinking Water:		
Bottled Water: Y	es No	
Wells Onsite: Y	es No	·
Public Water Supply: Y	'es No	
Name of Agency:		Contact Person;
Other:		Phone Number:
Any nositive or circumstantial ev	idence of a release to	groundwater?
		7
Describe.		
Source of information:	. 7.	
Is a release to groundwater from the following criteria and descrit		urces suspected? (Base this judgment on
Are sources poorly contained	ed?	
Is the source a type likely	to contribute to ground	water contamination (e.g., wet lagoon)?
NO		
Is the infiltration rate high		

	Is the site located in an area of karst terrain? Is the subsurface highly permeable or conductive?
	Is the subsurface highly permeable or conductive?
	Is drinking water drawn from a shallow aquifer?
	Are suspected contaminants highly mobile in groundwater?
	Does analytical or circumstantial evidence suggest groundwater contamination?
	Other criteria?
:	
i	y primary groundwater targets exist? (Base this judgment on the following criteria and be.) Is any drinking water well nearby?
i	Is any drinking water well nearby? NO, NO, FORI, LICIP Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water?
-i	Is any drinking water well nearby? NO, MO, MO, MI, LICIP Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate?
ri	Is any drinking water well nearby? NO, NO, NO, NO, NO, NO, NO, NO, NO, NO,
·i	Is any drinking water well nearby?
ri	Is any drinking water well nearby?
ri	Is any drinking water well nearby?
ri	Is any drinking water well nearby?
ri	Has any nearby drinking water well been closed? Has any nearby drinking water user reported foul-tasting or foul-smelling water? Does any nearby well have a large drawdown or high production rate? Is any drinking water well located between the site and other wells that are suspected to exposed to a hazardous substance? Does analytical or circumstantial evidence suggest contamination at a drinking water well boes any drinking water well warrant sampling?

•	, S	ite Name:
and the second of the second o	s	ite Number:
		•
Determine the location suspect have been exp	ns of and the number of people : osed to hazardous substances fro	served by drinking water wells that you om the site.
Discuss aroundwater :	isage within four miles of the si	ta
Discuss groundwater	isage within rout miles of the si	
- ***		
Squrce of information	· ·	
most boundary(ies) of		ne table below as measured from the outer supply wells. Provide apportionment
Distance	7	
<u>(miles)</u>	Population	
0 - 1/4		
1/4 - 1/2		
1/2 - 1		
1 – 2		
2 - 3		
3 - 4		
•	•	
Source of information	:	
What is the distance t	o the nearest drinking water wel	1?
	Su RIN LUCIP	
Are any wellhead pro	ection areas present within 4 mi	les of the site?
		
rrigation, commercia	from wells within 4 miles of the l livestock water, ingredient in co e, or supply for a major water re	e site used for commercial food/forage cro ommercial food preparation, supply for ecreation area? Specify.

SURFACE-WATER PATHWAY		
Identify the surface-water bodies t		
Meanst Surface water and the new rines.	e bodies are Braun	Dam, Codgelo C
and The New Your.		
Discuss the probable surface runoff	f patterns from the site to sur	face waters.
Samples have bun	Vaken at the abs	umentioned wa
during the RI.		
Provide a simplified sketch of surfa stream miles (page 23). Identify w		
Determine the average annual strea		
Water body:	Flow:	cfs
Water body:		cfs
Water body:		
Water body:		cfs
Water body:	Flow:	cfs
Source of information:		
Describe and locate on the surface	water features map (page 23)	the probable point of en
(PPE) of potential hazardous substa	ance into a perennial water b	ody
	and the second of the second o	
Measure the shortest overland flow (if part of the migration pathway is		
the overland measurement; measure		
Is the site or portions thereof locate	ed in surface water?	
<u> </u>		
What is the site flood frequency?		
•		

Site Name:	
Site Number:	

Any posi	tive or	circumstantial	evidence of	surface-water	contamination	from current	or historic
sources?	(Base	this judgment	on the follo	wing criteria a	nd describe.)		

*	*		Is surface water nearby? AC DRAINAGE SWALE IMPEDIATELY EAST
	*		Is waste quantity particularly large?
	*		Is the drainage area large?
			Is rainfall heavy?
			Is the infiltration rate low?
k	*		Are sources poorly contained or prone to runoff or flooding?
k	•		Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
<	*	78	Is vegetation stressed along the probable runoff route?
	¥		Are sediments or water unnaturally discolored?
	*		Is wildlife unnaturally absent?
	*		Has deposition of waste into surface water been observed?
	*		Is groundwater discharge to surface water likely?
. •,	*		Does analytical or circumstantial evidence suggest surface-water contamination?
	*		Other criteria?
		5	
,			ny primary surface-water targets exist? (Base this judgment on the following criteria and ribe.)
	*	_ 3-3-3-1	Is any target nearby? If yes, specify below:
	*		Drinking water intake
	*		Fishery
			Sensitive environment

	Site Name:
	Site Number:
\	
	Has any intake, fishery, or recreational area been closed?
	Does analytical or circumstantial evidence suggest surface-water contamination at or downstream of a target?
	Does any target warrant sampling? If yes, specify below:
	Drinking water intake
	Fishery
	Sensitive environment
	Other criteria?
	Primary intake(s) identified?
	Primary fisher(ies) identified?
	Primary sensitive environment(s) identified?
\	Arimary sensitive environment(s) identified.
	ream miles of the site.
_	·
So	ource of information:
	re any intakes part of a blended water supply system, and if so, how many other intakes or ells supply the same system?
W	hat is the distance to the nearest drinking water intake?
_	
De	escribe and locate fisheries within 15 downstream miles of the site.
50	urce of information:

	Si	te Name:	
e w	Si	te Number:	
Describe any sensitive envi stream miles of the site.	ronments (PA Guidance, PA	Table 5, page A-31)	within 15 down-
**************************************		·	
		·····	
Measure the total length (stream mile target distance	or frontage) of wetlands adj	acent to surface water	along the 15 down-
There are no a	utlands w/in Sit	e 78 (Baku.19)	44)

	POSURE PATHWAY known surficial (within 2 feet of su	rfaca) areas of	contamination o	n or adiacan
site.	KHOWH SHITICIAL (WITHIN 2 Teet of Sui	ilace) aleas of	Contamination	n or adjacen
	:		· · · · · · · · · · · · · · · · · · ·	
		·		· · · · · · · · · · · · · · · · · · ·
	al evidence of run-on/runoff?	Yes		
* Visi	al signs of contaminated run-on/ off?	Yes	No	_
Description	on and direction of site runoff:		•	
		·		
Surface-y	vater run-on from neighbor's proper	rty (identify so	urce directions a	nd contamin
		rty (identify so	urce directions a	nd contamin
			urce directions a	nd contamin
Determin the follow	e if a resident population for the soi ving criteria. Describe.	il exposure patl	away can be ider	atified on the
Determin the follow	e if a resident population for the soi	il exposure path ility on or with	iway can be ider in 200 feet of an adjacent land p	atified on the
Determinthe follow Is a con Is a leas	e if a resident population for the solving criteria. Describe. ny residence, school, or daycare factamination?	il exposure path ility on or with ility located on oread hazardous	in 200 feet of an adjacent land p	ntified on the
Determine the following Is a least l	e if a resident population for the soiving criteria. Describe. ny residence, school, or daycare factamination? ny residence, school, or daycare facted by the site owner/operator?	il exposure path ility on or with ility located on oread hazardous	in 200 feet of an adjacent land possibstances near	reviously ow

	Site Name:
	Site Number:
Resident population identified?	
· · · · · · · · · · · · · · · · · · ·	
	•
Determine the number of people occupying	residences or attending school or daycare on or
200 feet of areas of suspected contamination	1.
Is the facility active? YES	
2 4	
If yes, how many workers? 3-4	
How many workers are employed at offsite	facilities with suspected contamination?
	
Describe any terrestrial sensitive environment of suspected contamination.	ats (PA Guidance, PA Table 7, page A-39) on a
Are commercial agriculture, commercial silv	iculture, commercial livestock production, or
commercial livestock grazing present on area	as of suspected contamination? Specify.
ON	
Determine the population (these who live w	ork or attend cahool) within I mile of suspects
surficial contamination.	ork, or attend school) within 1 mile of suspecte

Site Name: _	
Site Number:	

AIR PATHWAY

	ribe current or historic sources for which migration of hazardous substances to the air
path	way could occur.
	release of hazardous substances to the air pathway suspected? (Base judgment on the wing criteria and describe.)
NC	Are odors currently reported or have they been reported in the past?
J	Has release of a hazardous substance to the air been directly observed?
	Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?
	Does analytical or circumstantial evidence suggest a release to the air?
	Other criteria?
	Suspected release?

*

Summarize the population within a four-mile radius of the site.

Distance (miles)	Population
* Onsite	
* 0 - 1/4	
1/4 - 1/2	
1/2 - 1	
1 - 2	
2 - 3	
3 - 4	

	Site Name:
	Site Number:
the ne	nine the distance from the outer boundary of the sources available to the air pathway to arest individual. (Nearest individual can be a worker, resident, or student. Measure from ter boundary of air sources to the building occupied by the nearest individual.)
	fy and locate any sensitive environments (PA Guidance, PA Table 5, page A-31) within (mile and 1/4 to 1/2 mile of the site.
:	

·	Sit	e Name:	
	Sit	e Number:	
Company Community			
General Comments			•
Describe any additional information of this space to document any assumption those assumptions.	collected and clari ons made for scori	fy any issues previous ng purposes, and the r	ly addressed. Use ationale behind
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REFERENCES

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INTERVIEWS	٠.						·	
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Site Name:	
Site Number:	

Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.

		N †
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Site Name: _	
Site Number:	

Corf	ace-	wa	tor	Fast	turac
Suri	ace-	wa	uer	геа	tures

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

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Site Name: _	HPISIZ
Site Number:	

CA HASHPAO

*

Photo Log

Photo Description Which Which Direction Comments

AZ 1+Z 2' 1512 WEST DRUNS/TIRES

Selle Silver

	Source	Source Tune	Size	Estimated			Sources of I	nformation
	Name	Source Type (PA Guidance, page A-6)	(volume/area)	Estimated Waste Quantity	Specific Compounds	Containment ²	Current	Historical
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			,					

Use additional sheets if necessary.
 Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

Table 2: Hydrogeologic Information¹

Strata Name/Description	Thickness (feet)	Hydraulic Conductivity (cm/sec)	Type of Discontinuity ²	Source of Information

¹ Use additional sheets if necessary.
2 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

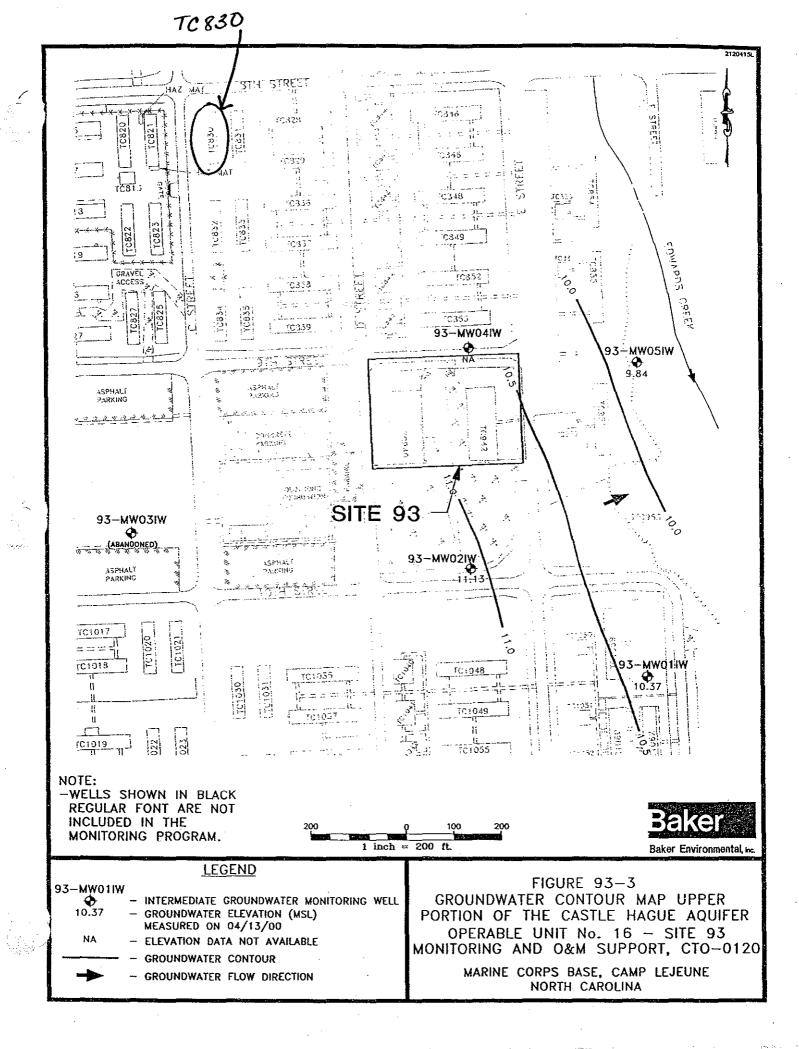
Table 3: Apportionment Calculations for Drinking Water Wells¹

Distance Category (miles)	Well Number	Well Name	System	Population Served by System	Total Wells Supplying System	Population Served by Well	Total Population Served for Distance Category
0 - 1/4							
1/2 - 1							
1 - 2							
2 - 3							And the second s
3 - 4							

 $^{^{1}}$ See PA Guidance, pages 63 and 64 for additional guidance on apportionment.

AIRSIDE

TC830



Site Name: TC 830	
Site Number:	

PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

SITE INFORMATION		•
Name and Title of Inspector:		Date:
		Time:
Site Location/Address: TC88C within C Approximate Area of Site (acres o	omp beizer. r square feet): Le	the Airside of Campleje noth-108'x width24'=2,5
	·	
corner & Eisth Stree	t and "C" S	building is located m 40 treet in Camp Geiser.
Name and Position of Site Contac	t:	
Telephone Number:		
Weather Conditions:		· · · · · · · · · · · · · · · · · · ·
Describe Surrounding Land Use Adjacent to the Site		
	South:	
	East:	
	West:	
,	•	_
Present Uses of Site:	Agricultural	Commercial
	Agricultural ndustrial	Commercial Undeveloped

Indicates Field/Record Search Task

	Si	te Name:		
	Si	te Number:		<u> </u>
Former Uses of Site:	Agricultural	<u> </u>	Commercial	
	Industrial		Undeveloped	
	Residential			
Describe uses and lengths of tin	1e. 1943-Consi	ructed,	Storchause	fo194
1965-1974-Acaden 1980-2000-Laund	nic Instruction	Building	, 1975-Ope	nstora
1980-2000)-Laund	ry/Exchance	Mar Clea	ning Plant	2001-St
	J'	7	J	
For former industrial and comm materials utilized.	ercial uses, describe ty	pes of process	es and hazardous	
no known Chemica	to used in ston	red hue.	t	*.
Is site used by Owner	or Tenants	· · · · · · · · · · · · · · · · · · ·		
Name of Tanante	Type of Hs	2	Length of Time	Used
Traine of Tenants				
TVAIRC OF TENANTS				
Traine of Tenants				
Traine of Tenants				
Describe the number, size, shap (page 22).				
Describe the number, size, shap (page 22).				
Describe the number, size, shap (page 22).				
Describe the number, size, shap (page 22).				
Describe the number, size, shap (page 22).	e, and use of existing s	tructures. Inc		
Describe the number, size, shap (page 22).	e, and use of existing s	tructures. Inc		
Describe the number, size, shap (page 22).	e, and use of existing s Average:	tructures. Inc		
Describe the number, size, shap (page 22). Site Housekeeping: Good:	e, and use of existing s Average:	tructures. Inc		

		Site Number:	
Environmental permits:			
Type	Agenc	· · · · · · · · · · · · · · · · · · ·	Expiration Date
			<u> </u>
Describe any emergency	or remedial actions that ha	ive occurred at the si	te.
*			
Source of information:		·	
Discuss existing samplin	g data and briefly summari	ze data quality (e.g.,	sample objective.
ige/comparability, analy	ytical methods, detections l	imits and QA/QC).	
	_		
	to at a close ?	to this build	Ling. Site 93
	to at a close of	to this build	Ling. Site 93
	to at a close of	to this build	Ling. Dite 93
	to at a close of	to this build	Ling. Site 93
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No Known da located Scut	nt:		Ling. Dite 93
No Known da located Scut		No	Ling. Dite 93
No Known da located Scut Vaste Water Managemen	nt: em: Domestic Yes Industrial Yes Domestic Yes	No No	Ling. Dite 93
No Known da located Sout Waste Water Managemen Onsite Septic Syste	nt: em: Domestic Yes Industrial Yes	No	Ling. Dite 93
Mo Known da located South Waste Water Managemen Onsite Septic Syste Public Sewer:	nt: em: Domestic Yes Industrial Yes Domestic Yes	No No No	Ling. Dite 93
Mo known da located Scrit Waste Water Managemen Onsite Septic Syste Public Sewer: Name of Agency:	nt: em: Domestic Yes Industrial Yes Domestic Yes Industrial Yes	NoNoNoNo	
Mo known da located Scrit Waste Water Managemen Onsite Septic Syste Public Sewer: Name of Agency:	nt: em: Domestic Yes Industrial Yes Domestic Yes	NoNoNoNo	
Maste Water Management Onsite Septic Syste Public Sewer: Name of Agency: Other:	nt: em: Domestic Yes Industrial Yes Domestic Yes Industrial Yes ter treatment systems.	No	
Maste Water Management Onsite Septic Syste Public Sewer: Name of Agency: Other:	nt: em: Domestic Yes Industrial Yes Domestic Yes Industrial Yes	No	
Maste Water Management Onsite Septic System Public Sewer: Name of Agency: Other:	nt: em: Domestic Yes Industrial Yes Domestic Yes Industrial Yes ter treatment systems.	No No No No Contact Person Phone Number	

FORMS(6) - Fld-Insp 0402041492

Site Name:		
Site Number:	•	

Leak

WASTE CHARACTERISTICS

* Describe underground tanks onsite and identify on site sketch.

Tank ID	Type and Capacity	Contents	Age	Location	Detection/ Secondary Containment	Registered <u>Y</u> N
	·			***************************************		
						
	-	***************************************	E-MIN-T-T-			

* Describe underground hazardous material piping systems at the site and identify on site sketch.

Location	Type of Pipe	Age	Type of Hazardous Material
		 	



Describe aboveground tanks onsite and identify on site sketch.

Tank ID	Type and Capacity	Contents	_Age_	Location	Detection/ Secondary Containment	Registered Y N N/A
**Yorketo						
			-			
···		· · · · · · · · · · · · · · · · · · ·			•	· · · · · · · · · · · · · · · · · · ·
		•				
•					-	
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Area ID	_ Paved_	Containment	No., Size, and Type of Containers	Condition of Containers	Contents	
					-	
		<u> </u>				
	······································					
				 		
List hazard	lous materi	als used onsite.			•	
	Name	of Material		No. and S	Size of Conta	iners
RCRA statı	us: N/A _	Generator	TSD	Transporte	r Per	rmitted ISD
		. '				
Describe tre	eatment, s	Generator torage, and dispoegulated units.				
Describe tre	eatment, s	torage, and dispo				
Describe tre	eatment, s	torage, and dispo				
Describe tre	eatment, s	torage, and dispo				
Describe tre	eatment, s	torage, and dispo				
Describe troidentify an	eatment, s y RCRA-r	torage, and dispo egulated units.				
Describe tro	eatment, s y RCRA-r	torage, and dispo egulated units.	sal procedures	for hazardous w		
Describe tro	eatment, s y RCRA-r	torage, and dispo egulated units.	sal procedures	for hazardous w	astes general	
Describe tro dentify an	eatment, s y RCRA-r	torage, and dispo egulated units.	sal procedures	for hazardous w	astes general	ted onsite an
Describe tro dentify an	eatment, s y RCRA-r	torage, and dispo egulated units.	sal procedures	for hazardous w	astes general	ted onsite ar

Location	Argol Siza	Nature of Stress	Source
Location			
Odors:			
	ence Des	cription	Source
Transformers:	• .		
	facturer		
	umber		
·	nce of PCB labels		
Fluorescent Light Ballas	·		
	Presence of "No		
	Yes	No	
Describe onsite debris an	ıd/or trash disposal ard	eas:	
Area ID or Loca	tion	Contents	
	· · · · · · · · ·		
			
Describe any restrictions	or barriers on accessil	bility to onsite waste mater	ials:
·			•
·			
the second secon			

Site Name: _	
Site Number:	· · · · · · · · · · · · · · · · · · ·

WASTE SOURCE SUMMARY

Complete this portion of the checklist only after all available current and historic waste characteristics data have been gathered through the field reconnaissance and record search. Table 1 is designed to help you delineate site sources for scoring purposes.

For each source at the site, summarize in Table 1 (page 25):

- 1. Source Name
- 2. Source Type (according to Source Type Descriptions in PA Guidance, page A-6)
- 3. Size/volume/area of all features/structures that might contain hazardous waste
- 4. Estimated waste quantity as measured onsite or from record search
- 5. Types of hazardous substances handled
- 6. Condition/integrity of each storage disposal feature or structure
- 7. Sources of information for current site conditions and historical site conditions

In the space below provand quantification (e.g high for conservative so	., when waste so	ource data is lim	ited and the wa	ste quantity is	estimated
					
					
	· · · · · · · · · · · · · · · · · · ·				
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Number of onsite drinking: and monitoring: wells. Show locations on site sketch (page 22). Obtain boring logs and well completion diagrams if available. Source of Site Drinking Water: Bottled Water: Yes No Wells Onsite: Yes No Public Water Supply: Yes No Name of Agency: Contact Person; Other: Phone Number: Any positive or circumstantial evidence of a release to groundwater?			Site I	Number:
Groundwater at Site: (identify depth, quality, gradient, and use) Depth to Symndwake is approx. 2 to 5 ft bega. and flow is toward the Edwards Crist. to the East of TC830 In Table 2 (page 26), give names, descriptions, and characteristics of geologic/hydrogeologic units underlying the site. Number of onsite drinking: and monitoring: wells. Show locations on site sketch (page 22). Obtain boring logs and well completion diagrams if available. Source of Site Drinking Water: Bottled Water: Yes No Wells Onsite: Yes No Public Water Supply: Yes No Name of Agency: Contact Person; Other: Phone Number: Any positive or circumstantial evidence of a release to groundwater? Describe: Source of information: Is a release to groundwater from current or historic sources suspected? (Base this judgment on the following criteria and describe.) Are sources poorly contained? Is the source a type likely to contribute to groundwater contamination (e.g., wet lagoon)? Is waste quantity particularly large? Is precipitation heavy?	GROUNDWATER PATHWA	Y		
Depth to Standwale in appress 2 to 5 st 1552, and flim in twand the Edward's Curt. to the East of TC830 In Table 2 (page 26), give names, descriptions, and characteristics of geologic/hydrogeologic inits underlying the site. Number of onsite drinking: and monitoring: wells. Show locations on site sketch (page 22). Obtain boring logs and well completion diagrams if available. Source of Site Drinking Water: Bottled Water: Yes No Wells Onsite: Yes No Public Water Supply: Yes No Contact Person; Other: Phone Number: Any positive or circumstantial evidence of a release to groundwater? Describe: Source of information: Is a release to groundwater from current or historic sources suspected? (Base this judgment on the following criteria and describe.) Are sources poorly contained? Is the source a type likely to contribute to groundwater contamination (e.g., wet lagoon)? Is waste quantity particularly large? Is precipitation heavy? Is precipitation heavy? Is precipitation heavy?	•		ality amadiams	and was
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Source of Site Drinking Water: Bottled Water: Yes No Wells Onsite: Yes No No Name of Agency: Contact Person; Other: Phone Number: Any positive or circumstantial evidence of a release to groundwater? Describe: Source of information: Is a release to groundwater from current or historic sources suspected? (Base this judgment on the following criteria and describe.) Are sources poorly contained? Is the source a type likely to contribute to groundwater contamination (e.g., wet lagoon)? Is waste quantity particularly large? Is precipitation heavy?	Number of onsite drinking: _sketch (page 22).	<u>()</u> and	monitoring:	wells. Show locations on site
Bottled Water: Yes No	Obtain boring logs and well c	completion d	iagrams if avail	able.
Wells Onsite: Yes No Public Water Supply: Yes No Name of Agency: Contact Person; Other: Phone Number: Any positive or circumstantial evidence of a release to groundwater? Describe: Source of information: Is a release to groundwater from current or historic sources suspected? (Base this judgment on the following criteria and describe.) Are sources poorly contained? Is the source a type likely to contribute to groundwater contamination (e.g., wet lagoon)? Is waste quantity particularly large? Is precipitation heavy?	Source of Site Drinking Wate	er:		
Public Water Supply: Yes No Contact Person; Name of Agency: Contact Person; Other: Phone Number: Any positive or circumstantial evidence of a release to groundwater? Describe: Source of information: Is a release to groundwater from current or historic sources suspected? (Base this judgment on the following criteria and describe.) Are sources poorly contained? Is the source a type likely to contribute to groundwater contamination (e.g., wet lagoon)? Is waste quantity particularly large? Is precipitation heavy?	Bottled Water.	Yes	No	
Name of Agency: Contact Person;	Wells Onsite:	Yes	No	
Other: Phone Number:	Public Water Supply:	Yes	No	<u> </u>
Any positive or circumstantial evidence of a release to groundwater? Describe: Source of information: Is a release to groundwater from current or historic sources suspected? (Base this judgment on the following criteria and describe.) Are sources poorly contained? Is the source a type likely to contribute to groundwater contamination (e.g., wet lagoon)? Is waste quantity particularly large? Is precipitation heavy?	Name of Agency:			Contact Person;
Describe: Source of information: Is a release to groundwater from current or historic sources suspected? (Base this judgment on the following criteria and describe.) Are sources poorly contained? Is the source a type likely to contribute to groundwater contamination (e.g., wet lagoon)? Is waste quantity particularly large? Is precipitation heavy?	Other:		·	Phone Number:
Is a release to groundwater from current or historic sources suspected? (Base this judgment on the following criteria and describe.) Are sources poorly contained? Is the source a type likely to contribute to groundwater contamination (e.g., wet lagoon)? Is waste quantity particularly large? Is precipitation heavy?	Describe:			
Are sources poorly contained? Is the source a type likely to contribute to groundwater contamination (e.g., wet lagoon)? Is waste quantity particularly large? Is precipitation heavy?		•	- _	
Is the source a type likely to contribute to groundwater contamination (e.g., wet lagoon)? Is waste quantity particularly large? Is precipitation heavy?	Is a release to groundwater for the following criteria and des	rom current scribe.)	or historic sour	ces suspected? (Base this judgment on
Is waste quantity particularly large? Is precipitation heavy?	Are sources poorly cont	ained?		
Is waste quantity particularly large?	· -	•	_	(),
	Is precipitation heavy?		· · · · · · · · · · · · · · · · · · ·	
· · · · · · · · · · · · · · · · · · ·				

	Site Number:
	Disc Hulliott.
	Can refu to the Site 93 Is the site located in an area of karst terrain? Let the subsurface highly permeable or conductive?
	Is drinking water drawn from a shallow aquifer?
	Are suspected contaminants highly mobile in groundwater?
	Does analytical or circumstantial evidence suggest groundwater contamination?
1	Other criteria?
	y primary groundwater targets exist? (Base this judgment on the following criteria and
i	y primary groundwater targets exist? (Base this judgment on the following criteria and be.) Is any drinking water well nearby?
i	be.)
i	be.) Is any drinking water well nearby?
i	be.) Is any drinking water well nearby?
i	Is any drinking water well nearby?
i	Is any drinking water well nearby?
i	Is any drinking water well nearby?
i	Is any drinking water well nearby?
i	Is any drinking water well nearby?
i	Is any drinking water well nearby?

	Site Name:
	Site Number:
Determine the locations of and suspect have been exposed to have	the number of people served by drinking water wells that you azardous substances from the site.
Discuss groundwater usage with	hin four miles of the site.
·	
Source of information:	
ource of intolliation.	
Summariza the nanulation carve	red by groundwater in the table below as measured from the our
nost boundary (ies) of the source	ce(s) to drinking water supply wells. Provide apportionment
calculations in Table 3 (page 2	7) if applicable.
Distance	
Distance(miles)I	Population
0 - 1/4	
1/4 - 1/2	
1/2 - 1	
1 - 2	
2 - 3	
3 - 4	
Source of information:	
What is the distance to the nea	rest drinking water well?
•	
are any wellnead protection are	reas present within 4 miles of the site?
	lls within 4 miles of the site used for commercial food/forage
s groundwater drawn from wel	
rrigation, commercial livestock	k water, ingredient in commercial food preparation, supply for ply for a major water recreation area? Specify.

	•			
SURFACE-WATER PATHWAY				
	nat could potentially receive runoff from the site.			
-	•			
Pawaras ouce of 4x	Le rearest matte body.			
Discuss the probable surface rupoff	patterns from the site to surface waters.			
	patterns from the site to surface waters.			
_				
Provide a simplified sketch of surfac stream miles (page 23). Identify wh	ce runoff and the surface-water flow system for 15 hich water courses are overland, intermittent, or pere			
Determine the average annual stream	m flow of downstream surface water for 15 downstre			
Water body:	Flow: cfs			
Water body:				
Water body:	Flow: cfs			
Water body:	Flow: cfs			
Water body:	Flow: cfs			
Source of information:				
Source of Information.				
Describe and locate on the surface w	water features map (page 23) the probable point of e			
(PPE) of potential hazardous substan	ince into a perennial water body.			
	·			
	distance from any source to a perennial surface-wate			
	via intermittent drainages, include these drainages a the course of water flow, not a straight line).			
Is the site or portions thereof located in surface water?				
NO				
What is the site flood frequency?				

Site Name:	:	
Site Number:		

Is waste quantity particularly large? Is the drainage area large? Is rainfall heavy? Is the infiltration rate low? Are sources poorly contained or prone to runoff or flooding? Is a runoff route well defined (e.g., ditch or channel leading to surface water)? Are sediments or water unnaturally discolored? Is wildlife unnaturally absent? Has deposition of waste into surface water been observed? Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	Is surface water nearby?	
Is rainfall heavy? Is the infiltration rate low? Are sources poorly contained or prone to runoff or flooding? Is a runoff route well defined (e.g., ditch or channel leading to surface water)? Are sediments or water unnaturally discolored? Is wildlife unnaturally absent? Has deposition of waste into surface water been observed? Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	Is waste quantity particularly large?	
Are sources poorly contained or prone to runoff or flooding? Is a runoff route well defined (e.g., ditch or channel leading to surface water)? Is vegetation stressed along the probable runoff route? Are sediments or water unnaturally discolored? Is wildlife unnaturally absent? Has deposition of waste into surface water been observed? Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	Is the drainage area large?	
Are sources poorly contained or prone to runoff or flooding?	Is rainfall heavy?	
Are sources poorly contained or prone to runoff or flooding?	Is the infiltration rate low?	
Is vegetation stressed along the probable runoff route? Are sediments or water unnaturally discolored? Is wildlife unnaturally absent? Has deposition of waste into surface water been observed? Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?		
Are sediments or water unnaturally discolored? Is wildlife unnaturally absent? Has deposition of waste into surface water been observed? Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	Is a runoff route well defined (e.g., ditch or channel leading to surface water)?	2
Is wildlife unnaturally absent? Has deposition of waste into surface water been observed? Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	Is vegetation stressed along the probable runoff route?	
Has deposition of waste into surface water been observed? Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	Are sediments or water unnaturally discolored?	
Has deposition of waste into surface water been observed? Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	Is wildlife unnaturally absent?	
Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?		
Other criteria?	Has deposition of waste into surface water been observed?	
	Is groundwater discharge to surface water likely?	
	Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination?	
	Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	
	Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	
	Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	
	Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	
	Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria?	
	Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria? any primary surface-water targets exist? (Base this judgment on the following criteria)	
	Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria? any primary surface-water targets exist? (Base this judgment on the following criteria cribe.)	
Is any target nearby? If yes, specify below:	Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria? any primary surface-water targets exist? (Base this judgment on the following criteria cribe.)	
	Is groundwater discharge to surface water likely? Does analytical or circumstantial evidence suggest surface-water contamination? Other criteria? any primary surface-water targets exist? (Base this judgment on the following criteria cribe.) Is any target nearby? If yes, specify below:	

* * ***

	Site Number:
	Has any intake, fishery, or recreational area been closed?
	Does analytical or circumstantial evidence suggest surface-water contamination at or downstream of a target?
	Does any target warrant sampling? If yes, specify below:
	Drinking water intake
	Fishery
	Sensitive environment
	Other criteria?
	Primary intake(s) identified?
	Primary fisher(tes) identified?
	Primary sensitive environment(s) identified?
Iden stre:	atify location and population served by surface water drinking water intakes within 15 dov am miles of the site.
Sou	rce of information:
Are well	any intakes part of a blended water supply system, and if so, how many other intakes or s supply the same system?
Wha	nt is the distance to the nearest drinking water intake?
Des	cribe and locate fisheries within 15 downstream miles of the site.
	

		Site Name:		
		Site Number:		
×		W		
Describe any sensitive envistream miles of the site.	ronments (PA Guidance,	PA Table 5, page	. A-31) withi	in 15 down-
			-	· · · · · · · · · · · · · · · · · · ·
		13		
			er de la composition de la composition de la composition de la composition de la composition de la composition	
ing success of the second	and grade Wales to the last of		· .	
	e e			
				and the second s
$(x,y,y,z) = (x,y,z) \cdot (x,y,z) \cdot (x,y,z) \cdot (x,y,z)$		and the second second	manager of the second	and the second second
en en en en en en en en en en en en en e		gel Geleger – konstruktur	and the second of the second o	and the second

Describe known surficial (within 2 feet of site.	surface) areas of contaminat	ion on or adjacen
44		
Mare known		
		<u></u>
 Visual evidence of run-on/runoff? Visual signs of contaminated run-or 	Yes No _	
* Visual signs of contaminated run-or runoff?	/ Yes No _	
Description and direction of site runoff:		
Surface-water run-on from neighbor's pr	perty (identify source directi	ons and contamin
	perty (identify source directi	ons and contamin
	perty (identify source directi	ons and contamin
	perty (identify source directi	ons and contamin
Determine if a resident population for the		e identified on the
	soil exposure pathway can be	e identified on the
Determine if a resident population for the the following criteria. Describe. Is any residence, school, or daycare	soil exposure pathway can be facility on or within 200 feet $ ot \sim C$	e identified on the of an area of sus
Determine if a resident population for the the following criteria. Describe. Is any residence, school, or daycare contamination? Is any residence, school, or daycare	soil exposure pathway can be facility on or within 200 feet $\frac{1}{\cancel{>}\mathcal{C}}$ facility located on adjacent lates spread hazardous substances	of an area of sus

	Site Number:
	Resident population identified?
Datas	
200 f	mine the number of people occupying residences or attending school or daycare on or veet of areas of suspected contamination.
Fe th	a facility active?
15 111	e facility active? Us
If ye	s, how many workers? 2-4 Cli-fine
How	many workers are employed at offsite facilities with suspected contamination?
	ribe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) on a spected contamination.
01 34	spected contamination.
120 0	commercial agriculture, commercial silviculture, commercial livestock production, or
comn	nercial livestock grazing present on areas of suspected contamination? Specify.
	סל
•	
Deter surfi	mine the population (those who live, work, or attend school) within 1 mile of suspecte cial contamination.

Site Name:	 	
Site Number:		

AIR PATHWAY

Describe current or historic sources for which migration of hazardous substances to the air pathway could occur.

nome known

Is a release of hazardous substances to the air pathway suspected? (Base judgment on the following criteria and describe.)

Are odors currently reported or have they been reported in the past?

Has release of a hazardous substance to the air been directly observed?

Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?

Does analytical or circumstantial evidence suggest a release to the air?

Other criteria?

Suspected release?

Summarize the population within a four-mile radius of the site.

Distance
(miles) Population

* Onsite

* 0 - 1/4

1/4 - 1/2

1/2 - 1

1 - 2

2 - 3

3 - 4

•		S	Site Number:		
General Comments					
Describe any additiona this space to document those assumptions.	l information coll any assumptions	ected and cla made for sco	rify any issue ring purposes	es previously addres , and the rationale	ssed. Use behind
					·
	-			<u> </u>	
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<u>REFEREN</u>	<u>CES</u>							
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INTERVIEWS					
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Site Name:	· · · · · · · · · · · · · · · · · · ·
Site Number:	

Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.

†

Site Name:	<u></u>	
Site Number:		

t .	Surface-	Water	Features

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

	 N †
	1
	:
	į

Site Number:

*

Photo Log

Photo Number		Description of Location	Looking Which Direction	Comments		
544	29	SAST-31DE	400म	OEBRIS		
1 2	30	NORTH - SIDE	South	* .		
, 3	²)`	WEST - 510E	South			
八数年	32	Scuth - 5:0E	NORTH			

Table 1: Source Summary¹

	Source	Course Turns	C:	Fatimated			Sources of I	nformation
	Name	Source Type (PA Guidance, page A-6)	Size (volume/area)	Estimated Waste Quantity	Specific Compounds	Containment ²	Current	Historical
-								
		·	ĺ					,
-	<u> </u>							
								·
			,			:		
	<u></u>				** ··· · · · · · · · · · · · · · · · ·			
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	: :		V					
L								

Use additional sheets if necessary.
 Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

Table 2: Hydrogeologic Information¹

Strata Name/Description	Thickness Hydraulic (feet) Conductivity (cm/sec)		Type of Discontinuity ²	Source of Information	
	• .				
	s.		* :		
		-			
				•	

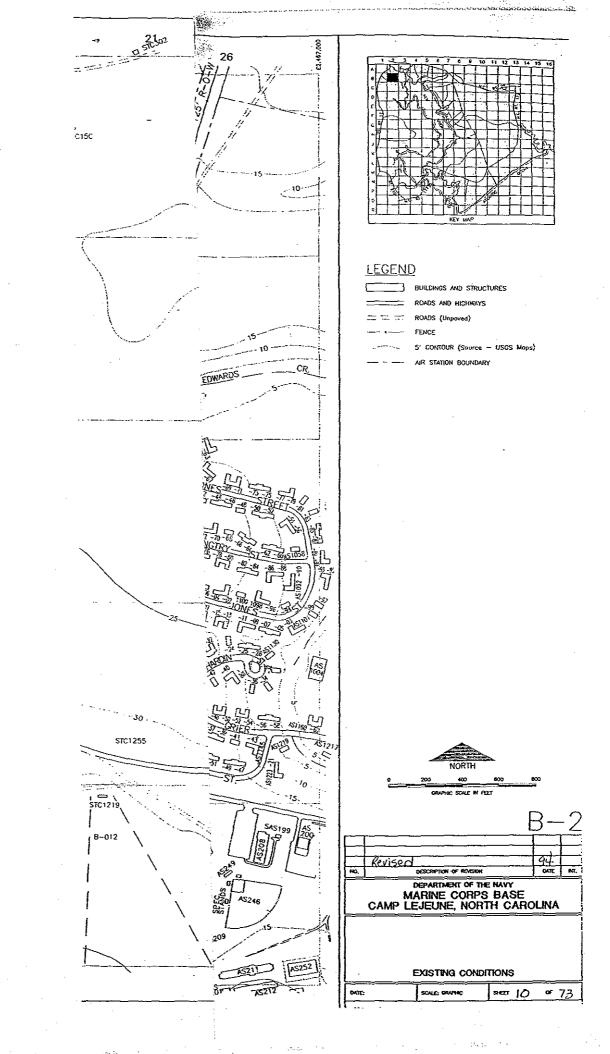
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¹ Use additional sheets if necessary.
2 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

AIRSIDE

SAS113

Note: Thomas, please verify where SAS113 attached on this map, a the athermap AS118



Site Name:	SHS113	
Site Number:		

PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

			Time:
Site Location/Address: <u>SAS</u> /	113 is locat	ed on the Ai	rside of Camp Liver
Site Location/Address: <u>SAS</u> Within Camp Yeigu Approximate Area of Site (acres o	South of I	RSitus 75+7	16293289.
Approximate Area of Site (acres of	or square feet): A	hereto 100's	c width 24' = 2,400
Direction to Site (from nearest pu	iblic road): _//	13 inlocate	dogg Bancrofts
next to building As.	114.	<u> </u>	
\mathcal{O}			
			, , , , , , , , , , , , , , , , , , ,
James and Decision of City Co. Ac-			
Name and Position of Site Contac			
Telephone Number:			
Veather Conditions:			
Describe Surrounding Land Use	North:		
Adjacent to the Site			
	South		
-			
	West:		
Present Uses of Site:	Agricultural		Commercial
	Industrial		Undeveloped
	Residential		
	acomena.		
	v Hobby &		

* Indicates Field/Record Search Task

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• •		Site Number:	
Former Uses of Site:	Agricultural Industrial Residential		Commercial Undeveloped
Describe uses and len	ogths of time. 1986 Bui	lding Consi	tructed and used
materials utilized.	and commercial uses, describe		
·	ner or Tenants		*
Name of Ten	ants or Tenants	<u>Use</u>	
Name of Ten Describe the number (page 22).	size, shape, and use of existing	Use g structures. Ind	cate locations on site ske
Name of Ten Describe the number (page 22).	size, shape, and use of existing	Use g structures. Ind	icate locations on site ske

, .				
Environmental permits:			·	·
Type		Agency		Expiration Date
				
•		·		
			- X	
Describe any emergency or a	remedial acti	ons that have o	occurred at the sit	te.
	•			
		:		
				
Source of information:	·			
in the vicinity of	of this bu	ilding.		
· 4				, , , , , , , , , , , , , , , , , , ,
Waste Water Management:				
Onsite Septic System:			No	
		Yes	No	
Public Sewer:	Domestic Industrial	Yes	No	
	muusman	1es <u> </u>	110	•
•				
			Contact Person	
Name of Agency:				
Name of Agency:		<u> </u>		
Name of Agency: Other: Describe onsite wastewater	treatment sys	stems.	Phone Number	
Name of Agency:	treatment sys	stems.	Phone Number	
Name of Agency: Other: Describe onsite wastewater	treatment sys	stems.	Phone Number	
Name of Agency: Other: Describe onsite wastewater	treatment sys	stems.	Phone Number	

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Site Name: _	
Site Number:	

WASTE CHARACTERISTICS

* Describe underground tanks onsite and identify on site sketch.

Tank ID	Type and <u>Capacity</u>	Contents	Age	<u>Location</u>	Leak Detection/ Secondary Containment	Registered Y N	
	530 gal.	Used Oil		AS/109-SAS-15	7	NFA	ļ
	550 sul	US ed Oil		AS-114			
	550 Sul	<u> </u>		AS-118			
	Hydraul	ic hifts		AS-114new			
				AS-118 new		<i>\bullet</i>	

* Describe underground hazardous material piping systems at the site and identify on site sketch.

Location	Type of Pipe	Age	Type of Hazardous Material
		·.	
			·. · · · · · · · · · · · · · · · · · ·

Describe aboveground tanks onsite and identify on site sketch.

À	Tank ID	Type and Capacity	Contents	_Age_	Location	Leak Detection/ Secondary Containment	Registered Y N N/A
1					•	· · · · · · · · · · · · · · · · · · ·	
							
			-			· · · · · · · · · · · · · · · · · · ·	
			***************************************		-		

Area ID Paved Containment Containers Containers Contents Evi Containers Contents Evi Containers Contents Evi Containers Contents Evi Containers Contents Evi Containers Contents Evi Containers Name of Material No. and Size of Containers pols	Area ID Paved Containment Containers Containers Contents Released. List hazardous materials used onsite. Name of Material No. and Size of Containers Polls RCRA status: N/A Generator TSD Transporter Permitted IS Describe treatment, storage, and disposal procedures for hazardous wastes generated onsite identify any RCRA-regulated units.				No., Size,	•		
List hazardous materials used onsite. Name of Material No. and Size of Containers Pols RCRA status: N/A Generator TSD Transporter Permitte Describe treatment, storage, and disposal procedures for hazardous wastes generated on identify any RCRA-regulated units.	List hazardous materials used onsite. No. and Size of Containers Pols RCRA status: N/A Generator TSD Transporter Permitted IS Describe treatment, storage, and disposal procedures for hazardous wastes generated onsite identify any RCRA-regulated units. Size 5	Area ID	Paved		and Type of Containers	Containers	Contents	Evidence o Release
List hazardous materials used onsite. No. and Size of Containers Pols RCRA status: N/A Generator TSD Transporter Permitte Describe treatment, storage, and disposal procedures for hazardous wastes generated on dentify any RCRA-regulated units.	Name of Material No. and Size of Containers Particle No. and Size of Containers							
Name of Material No. and Size of Containers Pols RCRA status: N/A Generator TSD Transporter Permitte Describe treatment, storage, and disposal procedures for hazardous wastes generated on identify any RCRA-regulated units.	Name of Material No. and Size of Containers Pols			· .				
Name of Material No. and Size of Containers Pols No. and Size of Containers	Name of Material No. and Size of Containers Pol 5 RCRA status: N/A Generator TSD Transporter Permitted IS Describe treatment, storage, and disposal procedures for hazardous wastes generated onsite dentify any RCRA-regulated units. FIRES					<u></u>		
RCRA status: N/A Generator TSD Transporter Permitte Describe treatment, storage, and disposal procedures for hazardous wastes generated on identify any RCRA-regulated units.	RCRA status: N/A Generator TSD Transporter Permitted ISD Transporter Tra	ist hazard	ous materi	als used onsite.				
RCRA status: N/A Generator TSD Transporter Permitte Describe treatment, storage, and disposal procedures for hazardous wastes generated on identify any RCRA-regulated units.	RCRA status: N/A Generator TSD Transporter Permitted ISD escribe treatment, storage, and disposal procedures for hazardous wastes generated onsite identify any RCRA-regulated units.		Name	of Material		No. and S	Size of Conta	iners
RCRA status: N/A Generator TSD Transporter Permitte Describe treatment, storage, and disposal procedures for hazardous wastes generated on dentify any RCRA-regulated units.	RCRA status: N/A Generator TSD Transporter Permitted IS Describe treatment, storage, and disposal procedures for hazardous wastes generated onsite identify any RCRA-regulated units.							•
RCRA status: N/A Generator TSD Transporter Permitte Describe treatment, storage, and disposal procedures for hazardous wastes generated on identify any RCRA-regulated units.	RCRA status: N/A Generator TSD Transporter Permitted IS Describe treatment, storage, and disposal procedures for hazardous wastes generated onsite identify any RCRA-regulated units. SCRA	 						
RCRA status: N/A Generator TSD Transporter Permitte Describe treatment, storage, and disposal procedures for hazardous wastes generated on identify any RCRA-regulated units.	RCRA status: N/A Generator TSD Transporter Permitted IS Describe treatment, storage, and disposal procedures for hazardous wastes generated onsite identify any RCRA-regulated units.							
Describe treatment, storage, and disposal procedures for hazardous wastes generated on dentify any RCRA-regulated units.	Describe treatment, storage, and disposal procedures for hazardous wastes generated onsite identify any RCRA-regulated units.							
Describe treatment, storage, and disposal procedures for hazardous wastes generated on dentify any RCRA-regulated units.	Describe treatment, storage, and disposal procedures for hazardous wastes generated onsite dentify any RCRA-regulated units.						· · · · · · · · · · · · · · · · · · ·	
dentify any RCRA-regulated units.	dentify any RCRA-regulated units.	CRA state	us: N/A	Generator				
	9/05	CCRA state	us: N/A _	Generator				
		escribe tr	eatment, si	torage, and dispo	TSD	Transporte	er Per	rmitted ISD
	D	escribe tr	eatment, si y RCRA-re	torage, and dispo egulated units.	TSD	Transporte	er Per	rmitted ISD
		escribe tr	eatment, si y RCRA-re	torage, and dispo egulated units.	TSD	Transporte	er Per	rmitted ISD
	D	escribe tr	eatment, si y RCRA-re	torage, and dispo egulated units.	TSD	Transporte	er Per	rmitted ISD
	Describe Discriberal Cata	escribe tr	eatment, si y RCRA-re	torage, and dispo egulated units.	TSD	Transporte	er Per	rmitted ISD
Describe Discolored Soil.	Describe Discolored Soil.	escribe tr	eatment, si y RCRA-re	torage, and dispo egulated units.	TSD	Transporte	er Per	rmitted ISD
		Describe tro	eatment, si y RCRA-re	torage, and dispo	TSD	Transporte	er Per	rmitted ISD
Location Areal Size Color Odor Sou	Location Areal Size Color Odor Source	Describe tro	eatment, si y RCRA-re	torage, and dispo	TSD	Transporte	er Per	rmitted ISD

Stressed Vegetation:	•		
Location	Areal Size	Nature of Stress	Source
			-
Odors:			
Location of Occurren	nce Des	ription	Source
			Source

m			
Transformers:			
Manuf	acturer		
ID Nu	mber		
Presen	ce of PCB labels	····	
Fluorescent Light Ballast	Presence of "No		
Fluorescent Light Ballast			
	Presence of "No	No	
Fluorescent Light Ballast Describe onsite debris and	Presence of "No	No	
	Presence of "No Yes	No	
Describe onsite debris and	Presence of "No Yes	No	
Describe onsite debris and Area ID or Locat	Presence of "No Yes	No	
Describe onsite debris and Area ID or Locat	Presence of "No Yes	noas: Contents	
Describe onsite debris and Area ID or Locat	Presence of "No Yes	noas: Contents	
Describe onsite debris and Area ID or Locat	Presence of "No Yes d/or trash disposal are	as: Contents	
Describe onsite debris and Area ID or Locat Describe any restrictions	Presence of "No Yes d/or trash disposal are ion or barriers on accessib	as: Contents ility to onsite waste materi	
Describe onsite debris and Area ID or Locat	Presence of "No Yes d/or trash disposal are ion or barriers on accessib	as: Contents	
Describe onsite debris and Area ID or Locat Describe any restrictions	Presence of "No Yes d/or trash disposal are ion or barriers on accessib	as: Contents ility to onsite waste materi	
Describe onsite debris and Area ID or Locat Describe any restrictions Area ID or Locat	Presence of "No Yes d/or trash disposal are ion or barriers on accessib	as: Contents ility to onsite waste materi	
Describe onsite debris and Area ID or Locat Describe any restrictions	Presence of "No Yes d/or trash disposal are ion or barriers on accessib	as: Contents ility to onsite waste materi	
Describe onsite debris and Area ID or Locat Describe any restrictions Level Level	Presence of "No Yes d/or trash disposal are ion or barriers on accessib	as: Contents ility to onsite waste materi	

Site Number:
WASTE SOURCE SUMMARY
Complete this portion of the checklist only after all available current and historic waste characteristics data have been gathered through the field reconnaissance and record search. Table 1 is designed to help you delineate site sources for scoring purposes.
For each source at the site, summarize in Table 1 (page 25):
1. Source Name
2. Source Type (according to Source Type Descriptions in PA Guidance, page A-6)
3. Size/volume/area of all features/structures that might contain hazardous waste
4. Estimated waste quantity as measured onsite or from record search
5. Types of hazardous substances handled
6. Condition/integrity of each storage disposal feature or structure
7. Sources of information for current site conditions and historical site conditions
In the space below provide any additional information/clarification on waste source delineation and quantification (e.g., when waste source data is limited and the waste quantity is estimated high for conservative scoring purposes, documentation of method and rationale is required):

		Site N	umber:
GROUNDWATER PATHWAY	Y		
Groundwater at Site: (identif		ality gradient s	and usa)
			·
7100 a gnerally	North -	twards E	dwards Creek.
		· · · · · · · · · · · · · · · · · · ·	
In Table 2 (page 26), give nar units underlying the site.	mes, descrip	tions, and chara	cteristics of geologic/hydrogeologic
			Twells fix.
Number of onsite drinking: _	and	monitoring:	ST wells. Show locations on site
sketch (page 22).			
Obtain boring logs and well c	omnletion d	iggrame if availa	able
Outain outing logs and well t	ombietion a	iagiaius II avalii	4010.
Source of Site Drinking Wate	r:		
Bottled Water:	Yes	No	
Wells Onsite:			
Public Water Supply:			
Name of Agency:			Contact Person;
Other:			Phone Number:
·			
Any positive or circumstantia	l evidence o	f a release to gre	oundwater?
Describe:	·		
			·
Source of information:			
Source of information.			
ls a release to groundwater fr the following criteria and des	rom current scribe.)	or historic sourc	ces suspected? (Base this judgment on
Are sources poorly cont	ained?	10	
Is the source a type like	ely to contri	bute to groundw	ater contamination (e.g., wet lagoon)?
	→ 		(
Is waste quantity partic	ularly large	?	
Is precipitation heavy?			

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	Site Name:
	Site Number:
Is the site located in an area	a of karst terrain?
Is the subsurface highly per	meable or conductive?
Is drinking water drawn fro	m a shallow aquifer?
Are suspected contaminants	highly mobile in groundwater?
Does analytical or circumsta	antial evidence suggest groundwater contamination?
Other criteria?	
·	
any primary groundwater targ	ets exist? (Base this judgment on the following criteria and
any primary groundwater targ cribe.)	
any primary groundwater targ ribe.) Is any drinking water well r	ets exist? (Base this judgment on the following criteria and
any primary groundwater targ cribe.) Is any drinking water well r Has any nearby drinking wa	ets exist? (Base this judgment on the following criteria and nearby?
any primary groundwater targ cribe.) Is any drinking water well t Has any nearby drinking wa Has any nearby drinking wa	nearby?
any primary groundwater targeribe.) Is any drinking water well r Has any nearby drinking wa Has any nearby drinking wa Does any nearby well have a	nearby?
any primary groundwater targeribe.) Is any drinking water well r Has any nearby drinking wa Has any nearby drinking wa Does any nearby well have a Is any drinking water well I exposed to a hazardous subs	nearby?
any primary groundwater targeribe.) Is any drinking water well related that any nearby drinking water well have a light any drinking water well have a least a	nearby?
any primary groundwater targeribe.) Is any drinking water well related that any nearby drinking water well have a light any drinking water well be exposed to a hazardous subsequence any drinking water well be a light and the subsequence analytical or circumstance.	nearby?
any primary groundwater targeribe.) Is any drinking water well related that any nearby drinking water well have a light any drinking water well be exposed to a hazardous subsequence any drinking water well be a light and the subsequence analytical or circumstance.	nearby?
any primary groundwater targeribe.) Is any drinking water well related that any nearby drinking water well have a light any drinking water well be exposed to a hazardous subsequence any drinking water well be a light and the subsequence analytical or circumstance.	nearby?

·	Site Maine:
	Site Number:
	•
Determine the locations of and the i	number of people served by drinking water wells that you dous substances from the site.
suspect have been exposed to nazare	ious substances from the site.
Discuss groundwater usage within (our miles of the site.
Source of information:	
Summarize the nanulation served by	groundwater in the table below as measured from the outer
most boundary(ies) of the source(s)	to drinking water supply wells. Provide apportionment
calculations in Table 3 (page 27) if	applicable.
D: (
Distance (miles) Popul	lation
0 - 1/4	
	
1/4 - 1/2	
1/2 - 1	
1 – 2	
2 - 3	
3 - 4	
Source of information:	
What is the distance to the nearest of	drinking water well?
Are any wellhead protection areas p	resent within 4 miles of the site?
ls groundwater drawn from wells wi	thin 4 miles of the site used for commercial food/forage cro
rrigation, commercial livestock wat	er, ingredient in commercial food preparation, supply for
commercial agriculture, or supply fo	or a major water recreation area? Specify.
No	
	-

	ntify the surface-water bodies that			·
	Edwards Cruk is to	e Clarest	* suga	e water b
Dis	cuss the probable surface runoff pa	itterns from the	e site to surfa	ce waters.
	drainage soole ras	it of 5,6	rect	
			·	
•				
	ovide a simplified sketch of surface eam miles (page 23). Identify whic			
Det	termine the average annual stream t		÷	
	Water body:		Flow:	
	Water body:		Flow:	efs
	Water body:	$\overline{}$	Flow:	cfs
	Water body:	·	Flow:	efs
	Water body:		Flow:	cfs
Sou	rce of information:			
				1
Des (PP	scribe and locate on the surface was E) of potential hazardous substanc	ter features ma e into a perenn	p (page 23) ti ial water bod	he probable point of v.
(Political Politi	-	
				-
Mea (if	asure the shortest overland flow dis part of the migration pathway is vi	tance from any a intermittent o	source to a plant	perennial surface-wa
the	overland measurement; measure th	e course of wat	er flow, not a	a straight line).
Is t	he site or portions thereof located i	in surface wate	r?	, and the second second
Wh.	at is the site flood frequency?			
	vite alvea alvageouty;			

Site Name: ____

	any positive or circumstantial evidence of surface-water contamination from current or histonurces? (Base this judgment on the following criteria and describe.)
:	Is surface water nearby?
	Is waste quantity particularly large?
:	Is the drainage area large?
	Is rainfall heavy?
	Is the infiltration rate low?
:	Are sources poorly contained or prone to runoff or flooding?
ŧ	Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
	Is vegetation stressed along the probable runoff route?
:	Are sediments or water unnaturally discolored?
ŧ	Is wildlife unnaturally absent?
:	Has deposition of waste into surface water been observed?
	Is groundwater discharge to surface water likely?
:	Does analytical or circumstantial evidence suggest surface-water contamination?
	Other criteria?

Do any primary surface-water targets exist? (Base this judgment on the following criteria and describe.)

Is any target nearby? If yes, specify below:

K	*	Drinking water intake
	*	Fishery
	*	Sensitive environment

	Site Name:
	Site Number:
Describe any sensitive environments (P stream miles of the site.	PA Guidance, PA Table 5, page A-31) within 15 down-
Measure the total length (or frontage) stream mile target distance limit of the	of wetlands adjacent to surface water along the 15 down- e site.

SOIL EXPOSURE PATHWAY				
Describe known surficial (within 2 feet of surficie).	ace) areas of co	ntamination o	n or adja	ent to

 Visual evidence of run-on/runoff? Visual signs of contaminated run-on/ 	Yes	No No		
runoff? Description and direction of site runoff:				
				•
Surface-water run-on from neighbor's propert potential).			nd conta	minatio
Surface-water run-on from neighbor's proper			and conta	minatio
Surface-water run-on from neighbor's propert potential).	y (identify sourc	ce directions a		
Surface-water run-on from neighbor's propert potential). Determine if a resident population for the soil the following criteria. Describe.	y (identify source	ce directions a		
Surface-water run-on from neighbor's propert potential). Determine if a resident population for the soil	exposure pathw	ce directions a	itified or	the ba
Surface-water run-on from neighbor's propert potential). Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facil	exposure pathwaity on or within	ay can be iden 200 feet of an	itified or	the ba
Surface-water run-on from neighbor's propert potential). Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facil contamination? Is any residence, school, or daycare facil	exposure pathwaity on or within	ay can be iden 200 feet of an ljacent land p	ntified or n area of reviously	suspec
Surface-water run-on from neighbor's propert potential). Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facil contamination? Is any residence, school, or daycare facil leased by the site owner/operator? Is there a migration route that might spr	exposure pathwaity on or within AC ity located on acceptable and hazardous such that the content of the content is reported and the content is	ay can be iden 200 feet of an ljacent land pubstances nea	n area of reviously	suspec
Surface-water run-on from neighbor's propert potential). Determine if a resident population for the soil the following criteria. Describe. Is any residence, school, or daycare facil contamination? Is any residence, school, or daycare facil leased by the site owner/operator? Is there a migration route that might spr or daycare facilities? Have onsite or adjacent residents or stud	exposure pathwaity on or within AC ity located on ac ead hazardous seems reported adation problems?	ay can be iden 200 feet of an ljacent land pubstances nea	n area of reviously r residen	suspec owned

	Site Number:
	Resident population identified?
Dete 200 :	rmine the number of people occupying residences or attending school or daycare on feet of areas of suspected contamination.
Is th	e facility active?
	s, how many workers? A5-114 A-6 workers full lime
	many workers are employed at offsite facilities with suspected contamination?
Desc	ribe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) o
Desc of su	ribe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) o spected contamination.
Desc of su	ribe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) of spected contamination.
Desc of su	ribe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) o
Are com	commercial agriculture, commercial silviculture, commercial livestock production, or nercial livestock grazing present on areas of suspected contamination? Specify.
Are com	commercial agriculture, commercial silviculture, commercial livestock production, or
Are com	commercial agriculture, commercial silviculture, commercial livestock production, or nercial livestock grazing present on areas of suspected contamination? Specify.
Are com	commercial agriculture, commercial silviculture, commercial livestock production, or mercial livestock grazing present on areas of suspected contamination? Specify.
Are comm	commercial agriculture, commercial silviculture, commercial livestock production, or mercial livestock grazing present on areas of suspected contamination? Specify.
Are comm	commercial agriculture, commercial silviculture, commercial livestock production, or nercial livestock grazing present on areas of suspected contamination? Specify.

Site Name: _		
a	£	
Site Number:	·	

AIR PATHWAY

Describe current or historic sources for which migration of hazardous substances to the air pathway could occur.

More	Known		 	
7()		_		
		 •	 	

Is a release of hazardous substances to the air pathway suspected? (Base judgment on the following criteria and describe.)

Are odors currently reported or have they been reported in th	ie past?
Has release of a hazardous substance to the air been directly	observed?
Are there reports of adverse health effects (e.g., headaches, resulting from migration of hazardous substances through th	
Does analytical or circumstantial evidence suggest a release t	o the air?
Other criteria?	
Suspected release?	

Summarize the population within a four-mile radius of the site.

Distance (miles)	Population
* Onsite	
* 0 - 1/4	
1/4 - 1/2	
1/2 - 1	
1 - 2	
2 - 3	
3 - 4	•



		Site Number:	
he nearest individual.	from the outer boundary of (Nearest individual can be ir sources to the building o	a worker, resident, or st	ident. Measure fron
			·
			•
	sensitive environments (PA 1/2 mile of the site.	Guidance, PA Table 5,	page A-31) within 0
o 1/4 mile and 1/4 to 3		a Guidance, PA Table 5,	page A-31) within 0
o 1/4 mile and 1/4 to 3	1/2 mile of the site.	a Guidance, PA Table 5,	page A-31) within (

·	Site Numi	Site Number:				
•						
General Comments						
Describe any additional information collected this space to document any assumptions made those assumptions.	and clarify an for scoring pu	y issues prev rposes, and	iously add the rationa	ressed. U de behind	Jse 1	
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REFERENCES		
Jim Dolph. Historical Search		
		
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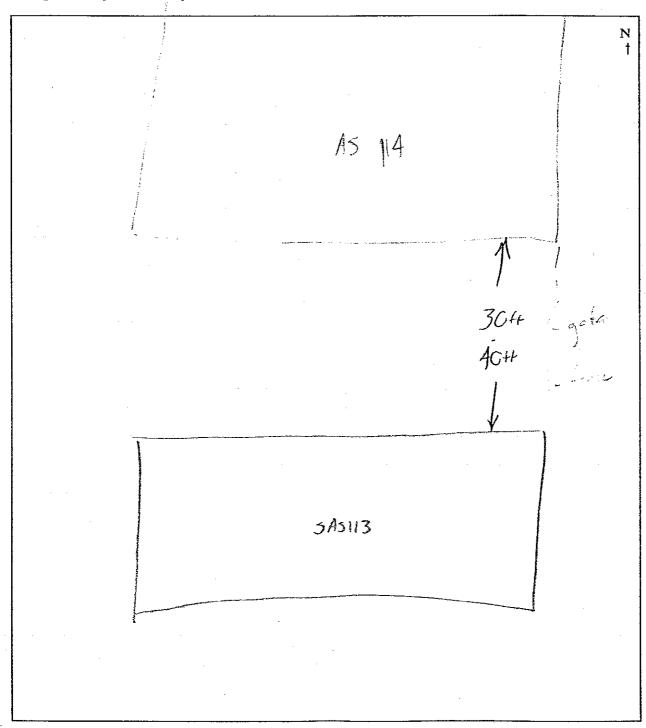
INTERVIEWS				
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Site Name: _	 	
Site Number:	 	

Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.



Site	Name:	<u></u>	
Site	Numbe	r:	

Surface-Water Features

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

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Site Name: _	SA5113	
Site Number:		



Photo Log

Photo Number	Description of Location	Looking Which Direction	Comments
553 1 6153	EAST SIDE	SOUTH-WEST	
Z 25 34	NOOTH SIDE	WEST	4- CPEN BAYS
3 4 35	WEST SIDE	EAST	, ,
556 4 32	SOUTH SIDE	WEST	- some orbns

Table 1: Source Summary¹

ſ	Source	Course Tune	Size	Estimated			Sources of I	nformation
	Name	Source Type (PA Guidance, page A-6)	(volume/area)	Waste Quantity	Specific Compounds	Containment ²	Current	Historical
	<i>(</i>							
								,
								,

				·				
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Use additional sheets if necessary.

Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

Table 2: Hydrogeologic Information¹

Strata Name/Description	Thickness (feet)	Hydraulic Conductivity (cm/sec)	Type of Discontinuity²	Source of Information
	·			

1 Use additional sheets if necessary.
2 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

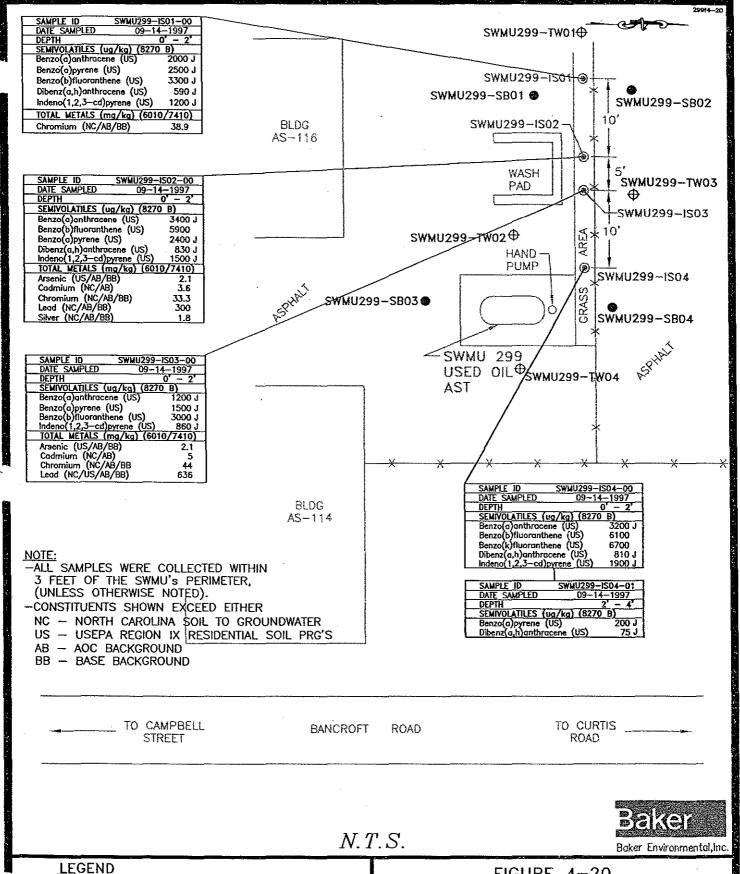
Table 3: Apportionment Calculations for Drinking Water Wells¹

Distance Category (miles)	Well Number	Well Name	System	Population Served by System	Total Wells Supplying System	Population Served by Well	Total Population Served for Distance Category
1/4 - 1/2							
1/2 - 1							
1 - 2							
2 - 3							
3 - 4							

¹ See PA Guidance, pages 63 and 64 for additional guidance on apportionment.

AIRSIDE

AS116



PROPOSED SOIL BORING

Ф PROPOSED TEMPORARY MONITORING WELL

EXISTING SOIL BORING SAMPLE (

mg/kg MILLIGRAM/KILOGRAM ug/kg MICROGRÁM/KILOGRAM FIGURE 4-20

PROPOSED PHASE II SWMU INVESTIGATION PLAN **SWMU 299**

MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA

Site Name: _	AS116	
Site Number:		

PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

Name and Title of Inspecto	r:	Date:	
		Time:	
Site Location/Address: As	SIIle is located	mke Airside of Comp	Lijeure, u
Car	np aizer	$\boldsymbol{\nu}$	
Approximate Area of Site (acres or square feet):	mte Airside of Comp Lingth 70'x width 51'	=3,57059
TO: 4* / CI*/ CE		1 1 1 P	
Direction to Site (from nea	rest public road): 200	rated of of Bancry	C+ ROAN.
	,		
	•		
Name and Position of Site	Contact:		
Telephone Number:			
Weather Conditions:			
Describe Surrounding Land Adjacent to the Site		Lindustrial	
	South:		
	East:	/	
	West	\checkmark	
	n csc		
Present Uses of Site:	Agricultural	Commercial	
	Industrial	Undeveloped	. *
		Ondeveloped	
	Residential		
Describe 2001-	A. L. 11 11 /1	On: + Shich	
Describe use. <u>2001-</u>	אן מממות שנענד	rung Shop	

* Indicates Field/Record Search Task

	e de la marca de la companya de la companya de la companya de la companya de la companya de la companya de la c	Site Name:	
		Site Numbe	r:
ŧ	Former Uses of Site: Agricu	ultural	Commercial
	Indus	trial	Undeveloped
	Reside	ential	
ŧ	Describe uses and lengths of time. 19	354-Constructed	1954-79-Combat Vel
	Maintanance Shop 1979-	-81 - Hay. Ham	mable storage 1913-8
	Auto Hobby Shop 1993	- Auto Hobbussi	no /Paint Shop
*	For former industrial and commercial unaterials utilized.	uses, describe types of p	processes and hazardous
	Vehicle Repair Relate	rd	
	-		
*	Is site used by Owner or	Tenants	
	Name of Tenants	Type of Use	Length of Time Used
			The state of the s
*	Describe the number, size, shape, and	use of existing structure	es. Indicate locations on site sketch
*	Describe the number, size, shape, and (page 22).		
•	Describe the number, size, shape, and		
*	Describe the number, size, shape, and (page 22).		
*	Describe the number, size, shape, and (page 22).	s niterited to	bein structure
*	Describe the number, size, shape, and (page 22).	s niterited to	bein structure
*	Describe the number, size, shape, and (page 22).	s niterited to	bein structure
*	Describe the number, size, shape, and (page 22). 1 mile building 4 bays Site Housekeeping: Good:	Average: Poo	r:

		Agency	Expiration Date
	i		
escribe any emergency or	remedial actions	hat have occurred at	the site.
•	-		
	-		ŧ
ource of information:			
outee of information.			
iscuss existing sampling da	ata and briefly su	mmarize data quality	(e.g., sample objective,
ge/comparability, analytic	al methods, detec	tions limits and QA/	QC).
SWMU #299 is (Vase to the	is building.	su tique.
SWMU #299 is (Se SAS 113 for	-115T in Lo	con tia i	
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			· · · · · · · · · · · · · · · · · · ·
aste Water Management:			
	Domestic Ves	No	
Onsite Septic System:			
Onsite Septic System:		No	
Onsite Septic System: Public Sewer:	Industrial Yes Domestic Yes	No	
	Industrial Yes	No	
Public Sewer:	Industrial Yes Domestic Yes Industrial Yes	No No	······
Public Sewer: Name of Agency:	Industrial Yes Domestic Yes Industrial Yes	No No No Contact	Person
Public Sewer:	Industrial Yes Domestic Yes Industrial Yes	No No No Contact	······
Public Sewer: Name of Agency: Other:	Industrial Yes Domestic Yes Industrial Yes	No No No Contact I	Person
Public Sewer: Name of Agency: Other: escribe onsite wastewater	Industrial Yes Domestic Yes Industrial Yes treatment systems	No No No No Contact I Phone No	Personumber
Public Sewer: Name of Agency: Other: escribe onsite wastewater	Industrial Yes Domestic Yes Industrial Yes treatment systems	No No No Contact I	Personumber
Public Sewer: Name of Agency: Other: escribe onsite wastewater	Industrial Yes Domestic Yes Industrial Yes treatment systems	No No No No No No No No No No No No No N	Personumber
Public Sewer: Name of Agency: Other: escribe onsite wastewater	Industrial Yes Domestic Yes Industrial Yes treatment systems	No No No No No No No No No No No No No N	Person umber
Public Sewer: Name of Agency: Other: escribe onsite wastewater	Industrial Yes Domestic Yes Industrial Yes treatment systems	No No No No No No No No No No No No No N	Person
Public Sewer: Name of Agency: Other: escribe onsite wastewater	Industrial Yes Domestic Yes Industrial Yes treatment systems	No No No No No No No No No No No No No N	Person

Site Name:		 	
Site Number	r:	 	

WASTE CHARACTERISTICS

* Describe underground tanks onsite and identify on site sketch.

Refu Tank ID	fo SAS 11. Type and Capacity	Contents	Age	Location	Leak Detection/ Secondary Containment	Registered Y N
			· · · · · · · · · · · · · · · · · · ·			
		·. —————		<u> </u>		
				-		

* Describe underground hazardous material piping systems at the site and identify on site sketch.

Location	Type of Pipe	_Age_	Hazar	Type of lous Material
• .			4 · · · · · · · · · · · · · · · · · · ·	
				1 41

X

Describe aboveground tanks onsite and identify on site sketch.

Tank ID	Type and Capacity	Contents	_Age_	Location	Leak Detection/ Secondary Containment	Registered Y N N/A
-						· · · · · · · · · · · · · · · · · · ·
				·		
						
						

		Containment sh. Hered	<u>Containers</u>			
					· · · · · · · · · · · · · · · · · · ·	
List hazard	lous materi	als used onsite.		-		
		of Material				
		906 A				
					· · · · · · · · · · · · · · · · · · ·	
RCRA state		Generator	TSD _	Transporte	er Per	rmitted ISD
Describe tr	us: N/A _					
Describe tr	us: N/A _	Generator torage, and dispoegulated units.		for hazardous w		
Describe tr	us: N/A _	Generator torage, and dispoegulated units.	sal procedures	for hazardous w		
Describe tr	us: N/A _	Generator torage, and dispoegulated units.	sal procedures	for hazardous w		
Describe tr	us: N/A _	Generator torage, and dispoegulated units.	sal procedures	for hazardous w		
Describe tr	us: N/A _ eatment, s y RCRA-r	Generator torage, and dispo egulated units.	sal procedures	for hazardous w		

	Areal Size	Nature of S	tress Sour
	:		
	•		
Odors:			
Location of Occurre	nce De	scription	Source
	·		
Transformers:			
	facturer _		
ID Nu	mber		
Preser	nce of PCB labels _		·
Fluorescent Light Ballas	ts:	•	
	Presence of "N	No PCB" labels	
		No PCB" labels	
Describe ansite debris an	Yes	No	
Describe onsite debris an	Yesd/or trash disposal a	No	
Describe onsite debris an Area ID or Locat	Yesd/or trash disposal a	No	ontents
	Yesd/or trash disposal a	No	ontents
	Yesd/or trash disposal a	No	ontents
Area ID or Locat	Yesd/or trash disposal a	NoC	
Area ID or Locat	Yesd/or trash disposal a	NoC	ste materials:
Area ID or Locat	Yesd/or trash disposal a	NoC	ste materials:
Area ID or Locat	Yesd/or trash disposal a	NoC	ste materials:

Site Name: __ Site Number:

Site	Name:
Site	Number:
ASTE SOURCE SUMMARY	
omplete this portion of the checklist only after all ava aracteristics data have been gathered through the fiel ble 1 is designed to help you delineate site sources for	d reconnaissance and record search.
r each source at the site, summarize in Table 1 (page	25):
1. Source Name	
2. Source Type (according to Source Type Descrip	otions in PA Guidance, page A-6)
3. Size/volume/area of all features/structures tha	t might contain hazardous waste
4. Estimated waste quantity as measured onsite or	from record search
5. Types of hazardous substances handled	
6. Condition/integrity of each storage disposal fe	ature or structure
7. Sources of information for current site condition	ons and historical site conditions
the space below provide any additional information/ord quantification (e.g., when waste source data is liming for conservative scoring purposes, documentation or	ted and the waste quantity is estimated
	<u> </u>

	Site N	umber:
GR <u>OUNDWATER</u> PATHWAY		
Groundwater at Site: (identify depth, qu	uality gradiant s	and usa)
•		
Vic a doning L	cois celua	1.
VICE a download 6	homel neth	crk
In Table 2 (page 26), give names, descriunits underlying the site.	ptions, and chara	cteristics of geologic/hydrogeologic
Number of onsite drinking: and sketch (page 22).	d monitoring: 🤦	wells. Show locations on site
Obtain boring logs and well completion	diagrams if availa	able.
Source of Site Drinking Water:		
Bottled Water: Yes	No	en de la companya de la companya de la companya de la companya de la companya de la companya de la companya de La comp ensa de la companya de la companya de la companya de la companya de la companya de la companya de la comp
Wells Onsite: Yes	No	
Public Water Supply: Yes	No	
Name of Agency:		Contact Person;
Other:		Phone Number:
Annual attention and attention to		
Any positive or circumstantial evidence	of a release to gre	oundwater?
Describe:	<u> </u>	
Source of information:	,	
Is a release to groundwater from current the following criteria and describe.)	t or historic sourc	ces suspected? (Base this judgment on
Are sources poorly contained?		
Is the source a type likely to contr	ibute to groundw	ater contamination (e.g., wet lagoon)?

FORMS(6) - Fld-Insp 0402041492

	Site Name:	
•	Site Number:	· · · · · · · · · · · · · · · · · · ·
Is the site located in an area of ka	rrst terrain?	·
Is the subsurface highly permeabl	e or conductive?	
	allow aquifer?	
Are suspected contaminants highly	y mobile in groundwater?	
Does analytical or circumstantial	evidence suggest groundwater contaminati	on?
Other criteria?		
THE VIEW OF THE PROPERTY OF TH		
ny primary groundwater targets exi ibe.)	st? (Base this judgment on the following	criteria an
ibe.)	st? (Base this judgment on the following	
ibe.) Is any drinking water well nearby		
ibe.) Is any drinking water well nearby Has any nearby drinking water we	?	
ibe.) Is any drinking water well nearby Has any nearby drinking water we Has any nearby drinking water us	?	vater?
ibe.) Is any drinking water well nearby Has any nearby drinking water we Has any nearby drinking water us Does any nearby well have a large	?	vater?
ibe.) Is any drinking water well nearby Has any nearby drinking water we Has any nearby drinking water us Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance:	?	vater?suspected t
ibe.) Is any drinking water well nearby Has any nearby drinking water we Has any nearby drinking water us Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance:	ell been closed? er reported foul-tasting or foul-smelling to drawdown or high production rate? between the site and other wells that are evidence suggest contamination at a drink	vater?suspected t
Is any drinking water well nearby Has any nearby drinking water we Has any nearby drinking water us Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance; Does analytical or circumstantial	ell been closed? er reported foul-tasting or foul-smelling with the drawdown or high production rate? between the site and other wells that are evidence suggest contamination at a drink rant sampling?	vater?suspected t
Is any drinking water well nearby Has any nearby drinking water we Has any nearby drinking water us Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance: Does analytical or circumstantial Does any drinking water well ware	ell been closed? er reported foul-tasting or foul-smelling with the drawdown or high production rate? between the site and other wells that are evidence suggest contamination at a drink rant sampling?	vater?suspected t
Is any drinking water well nearby Has any nearby drinking water we Has any nearby drinking water us Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance: Does analytical or circumstantial Does any drinking water well ware	ell been closed? er reported foul-tasting or foul-smelling with the drawdown or high production rate? between the site and other wells that are evidence suggest contamination at a drink rant sampling?	vater?suspected t
Is any drinking water well nearby Has any nearby drinking water we Has any nearby drinking water us Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance: Does analytical or circumstantial Does any drinking water well ware	ell been closed? er reported foul-tasting or foul-smelling with the drawdown or high production rate? between the site and other wells that are evidence suggest contamination at a drink rant sampling?	vater?suspected t

	Site Number:
	•
Determine the locations of and the numbers uspect have been exposed to hazardous s	er of people served by drinking water wells that you substances from the site.
Discuss groundwater usage within four m	iles of the site.
Side the state of	nus or tip snor
Source of information:	
Distance (miles) Population	
	<u>tanan ara-</u>
0 - 1/4	
1/4 - 1/2	
1/2 - 1	
1 - 2	
2 - 3	
3 - 4	
Source of information:	<u> </u>
What is the distance to the nearest drink	ing water well?
Are any wellhead protection areas presen	t within 4 miles of the site?
-	
	4 miles of the site used for commercial food/forage cro
s groundwater drawn from wells within a rrigation, commercial livestock water, in commercial agriculture, or supply for a m	agredient in commercial food preparation, supply for a jor water recreation area? Specify.

*

Identify the surface-water bodies that	could potentially receive runoff from the site.
Edwards Cruk	
Discuss the probable surface runoff pa	tterns from the site to surface waters.
- DEAINAGE TO NORTH IN	TO SMALE
stream miles (page 23). Identify which	runoff and the surface-water flow system for a water courses are overland, intermittent, or plow of downstream surface water for 15 downs
Water body:	
	Flow: cfs
Water body:	
Water body:	
Water body:	
Source of information:	
(PPE) of potential hazardous substanc	
(if part of the migration pathway is vi-	tance from any source to a perennial surface—a intermittent drainages, include these drainage course of water flow, not a straight line).
Is the site or portions thereof located i	n surface water?
is the site of portions thereof located i	

Site Name: _	
Site Number:	

X - 5 2 8C
Is surface water nearby?
Is waste quantity particularly large?
Is the drainage area large?
Is rainfall heavy?
Is the infiltration rate low?
Are sources poorly contained or prone to runoff or flooding?
Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
Is vegetation stressed along the probable runoff route?
Are sediments or water unnaturally discolored?
Is wildlife unnaturally absent?
Has deposition of waste into surface water been observed?
Is groundwater discharge to surface water likely?
Does analytical or circumstantial evidence suggest surface-water contamination?
Other criteria?

	Site Number:
Has any intake, fishery, or	recreational area been closed?
Does analytical or circumst downstream of a target?	antial evidence suggest surface-water contamination at or
Does any target warrant sai	npling? If yes, specify below:
Drinking water intake	<u> </u>
Fishery	
Sensitive environment	
Other criteria?	
Primary intake(s) identifie	d? ed?
Primary fisher(ies) identifi	ed?
	ent(s) identified?
Source of information:	d water supply system, and if so, how many other intakes or
What is the distance to the near	st drinking water intake?
Describe and locate fisheries wit	hin 15 downstream miles of the site.
Source of information:	
~~~ vi intuimatium.	

	Site N	me:
	Site No	mber:
Describe any sensitive environm stream miles of the site	nents (PA Guidance, PA Ta	ble 5, page A-31) within 15 down-
	· · · · · · · · · · · · · · · · · · ·	
Measure the total length (or frostream mile target distance lim	ontage) of wetlands adjace it of the site.	nt to surface water along the 15 down-
	•	

Visual evidence of run-on/runoff?  Visual signs of contaminated run-on/ Yes No runoff?  Description and direction of site runoff:  Surface-water run-on from neighbor's property (identify source directions and contamination potential).  Determine if a resident population for the soil exposure pathway can be identified on the best the following criteria. Describe.  Is any residence, school, or daycare facility on or within 200 feet of an area of suspect contamination?  Is any residence, school, or daycare facility located on adjacent land previously owned leased by the site owner/operator?  Is there a migration route that might spread hazardous substances near residences, sellor daycare facilities?  Have onsite or adjacent residents or students reported adverse health effects, exclusive apparent drinking water or air contamination problems?  Does any neighboring property warrant sampling?  Other criteria?	Describe known sur	ficial (within 2 feet of su	rface) areas of	contamination	n on or adja	icent to
* Visual evidence of run-on/runoff? Yes No Visual signs of contaminated run-on/ Yes No runoff?  Description and direction of site runoff:  Surface-water run-on from neighbor's property (identify source directions and contamination potential).  Determine if a resident population for the soil exposure pathway can be identified on the best the following criteria. Describe.  Is any residence, school, or daycare facility on or within 200 feet of an area of suspecton tamination?  Is any residence, school, or daycare facility located on adjacent land previously owned leased by the site owner/operator?  Is there a migration route that might spread hazardous substances near residences, school daycare facilities?  Have onsite or adjacent residents or students reported adverse health effects, exclusive apparent drinking water or air contamination problems?  Does any neighboring property warrant sampling?		.04		•		
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Site Name: Site Number:

	Site Name:
	Site Number:
	Resident population identified?
Deter 200 f	mine the number of people occupying residences or attending school or daycare on or wit eet of areas of suspected contamination.
Is th	e facility active?
	· · · · · · · · · · · · · · · · · · ·
If ye	s, how many workers? 4-3 4-1 time
Desc	ribe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) on an
of su	spected contamination.
Are comm	commercial agriculture, commercial silviculture, commercial livestock production, or nercial livestock grazing present on areas of suspected contamination? Specify.
Dete:	rmine the population (those who live, work, or attend school) within 1 mile of suspected cial contamination.
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Site Name: _	
Site Number:	

#### AIR PATHWAY

Describe current or historic sources for which migration of hazardous substances to the air pathway could occur.

none	known	 		
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Is a release of hazardous substances to the air pathway suspected? (Base judgment on the following criteria and describe.)

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 Are odors currently reported or have they been reported in the past?
Has release of a hazardous substance to the air been directly observed?
Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?
Does analytical or circumstantial evidence suggest a release to the air?
Other criteria?
Suspected release?

Summarize the population within a four-mile radius of the site.

Distance (miles)	Population
* Onsite	
* 0 - 1/4	
1/4 - 1/2	
1/2 - 1	
1 - 2	
2 - 3	
3 – 4	

	Sice Ivalie.
	Site Number:
Determine the distance fr the nearest individual. (N	ermine the distance from the outer boundary of the sources available to the air pathway to nearest individual. (Nearest individual can be a worker, resident, or student. Measure from outer boundary of air sources to the building occupied by the nearest individual.)  attify and locate any sensitive environments (PA Guidance, PA Table 5, page A-31) within 0/4 mile and 1/4 to 1/2 mile of the site.
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Site Name:	
Site Number:	

### **General Comments**

Describe any additional information collected and clarify any issues previously addressed. Use this space to document any assumptions made for scoring purposes, and the rationale behind those assumptions.

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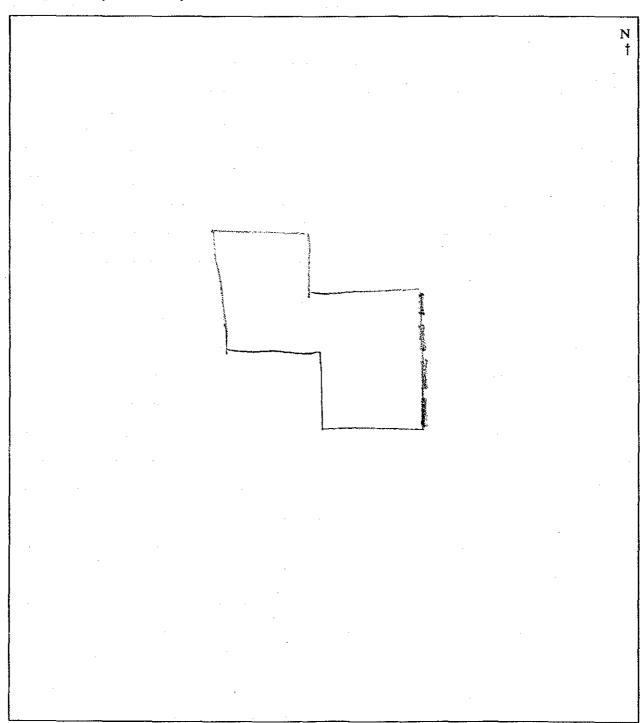
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<del></del>		<del></del>		<u> </u>	
·					

Site Name: _	 
Site Number:	 

# Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.



Site Name:	_
Site Number:	_

## Surface-Water Features

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

 		· · · · · · · · · · · · · · · · · · ·				N
				. *	-	N †
						•
	•					
			-			
					•	
				-		

Site Name:	
Site Number:	

ASILG

X

Photo Log

	Photo Jumbe		Description of Location	Looking Which Direction	Comments
ZA7	1	51	EAST SIDE	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	Carlot Color Man
541	7	38	SCUTH SIDE	we at HEAST	
	3	34	WEST SIDE	! #5\\	( NOTE OPEN STERAGE)
	4	ųθ	ENATY DRUMS	HAST	W CPEN STORAGE)
γ	3	41	WERTH KIDE	SOUTHWEST	Copen sizege) BARY ORONS
552	6	1/2	bund of he	NORTH	(BT IN BALENCEAR 15 TUME)

Sauraa	Source Turns	Cina	Fastmand			Sources of I	nformation
Source Name	Source Type (PA Guidance, page A-6)	Size (volume/area)	Estimated Waste Quantity	Specific Compounds	Containment ²	Current	Historical
			š I				
		ŕ					,
				·			
					-		
				, .			
		:					
		·					

Use additional sheets if necessary.
 Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

Table 2: Hydrogeologic Information¹

Strata Name/Description	Thickness (feet)	Hydraulic Conductivity (cm/sec)	Type of Discontinuity ²	Source of Information

Use additional sheets if necessary.
 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

Table 3: Apportionment Calculations for Drinking Water Wells¹

<u> </u>					<del>,</del>		
Distance Category (miles)	Well Number	Well Name	System	Population Served by System	Total Wells Supplying System	Population Served by Well	Total Population Served for Distance Category
0 - 1/4							
1 / 1 / 2							
1/4 - 1/2						<del>\</del>	
			,.			<del></del>	
1/2 - 1							
, -,				<del></del>			
. [							
1 - 2				<del></del>			
2 - 3						,	
			<del> </del>				
			· · · · · · · · · · · · · · · · · · ·				
				·			
3 - 4							

¹ See PA Guidance, pages 63 and 64 for additional guidance on apportionment.

# **AIRSIDE**

**AS119** 

Site Name: AS/19	<del></del> _
Site Number:	

# PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

lame and Title of Inspector:	Date:	
	Time	
Site Location/Address: <u>ASII9 15/6</u>	ated in the Ariside of	Zamphijune ui
Camp Giger the White Str	cet	
ite Location/Address: <u>ASII9 is to</u> Camp Yugu Hy White Sh Approximate Area of Site (acres or squar	e feet): kingth 120'x W	24'= 2,880 87.1
Direction to Site (from nearest public roa		
incerion to the (from hearest public for	u).	
Name and Position of Site Contact:		
elephone Number:		
Veather Conditions:		·
Describe Surrounding Land Use No	th: Undustrial	
Adjacent to the Site Sou	th:	
Eas	. /	
We	t:	
Present Uses of Site: Agricult		mercial
Industri		eveloped
Residen	ial	
Describe use. 2000 - Auto Ma	nurance facility	
		ALILITY
	310 11111111111111111111111111111111111	- 104V
	NO MAINTENANCE	; WORK

•

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		Site Number:	
Former Uses of Site:	Agricultural Industrial Residential	Con	nmercial leveloped
Describe uses and leng	ths of time. 1963-Cons	tructed Auto V	Chicle Mainten on Rack.
materials utilized.	and commercial uses, describe		
Name of Tena	or Tenants	Use Le	
e e			<u> </u>
(page 22).	size, shape, and use of existing		locations on site sketch
Site Housekeeping: (	Good: Average:	Poor:	
Describe Housekeeping	g Condition.		

Site Name:	 
Site Number:	

Type		Agency	Expiration Date
	·		
•		·	• · · · · · · · · · · · · · · · · · · ·
escribe any emergency	or remedial actions	that have occurred	at the site.
, <u> </u>			
ource of information:			
Ame known	refu to SI	75/13 for W	st data info.
Mme Known	refu. to St	75 113 fu U	st dada info.
Mme Known	refu to St	75 113 fu 11	st dada info.
Mme known	refu. to SI	75/13 fu 11	st dada info.
	V	75 113 fu 11	st dada info.
Vaste Water Managemen	it: m: Domestic Yes	No	
Vaste Water Managemen Onsite Septic Syste	nt: m: Domestic Yes Industrial Yes	No No	
Vaste Water Managemen	it: m: Domestic Yes	No No	
Vaste Water Managemen Onsite Septic Syste Public Sewer:	m: Domestic Yes Industrial Yes Domestic Yes Industrial Yes	No No No	
Vaste Water Managemen Onsite Septic Syste	m: Domestic Yes Industrial Yes Domestic Yes Industrial Yes	No No No No Contact	et Person
Vaste Water Managemen Onsite Septic Syste Public Sewer:	nt: m: Domestic Yes Industrial Yes Domestic Yes Industrial Yes	No No No No Contact	
Vaste Water Managemen Onsite Septic Syste Public Sewer: Name of Agency: _ Other:	nt: m: Domestic Yes Industrial Yes Domestic Yes Industrial Yes	No No No No Contac	et Person
Vaste Water Managemen Onsite Septic Syste Public Sewer:  Name of Agency: Other:	m: Domestic Yes Industrial Yes Domestic Yes Industrial Yes	No No No No No Contact Phone ss.	et Person

:1] = 386.

Site Name: _	<del></del>	 	<del></del>
Site Number:	•	 	

# **WASTE CHARACTERISTICS**

Tank ID	Type and Capacity	<u>Contents</u>	Age	Location	Detection/ Secondary Containment	Register Y N
		<del></del>		<u> </u>		<del></del>
	<u></u>					
Describe und	erground haz:	ardous material	piping syst	ems at the site	and identify on s	ite sketc

X	*

Describe aboveground tanks onsite and identify on site sketch.

Tank ID		Contents	Age	Location	Detection/ Secondary Containment	Registered Y N N/A
	250sal.	Lucloil	<del></del>	50VIH-319	E_yco_	
-						
						<u> </u>

Site Name:	
Site Number:	

Describe container storage areas and identify on site sketch.

Area ID	Paved	Containment		Condition of Containers		Evidence of Release
	413		8-10 dunps	his good	- mpty	10
· · ·						
- /						
			<del></del>	,		
List hazard	lous materi	als used onsite.				
	Name	of Material		No. and S	Size of Conta	iners
	<del></del>					<del></del>
-						<del></del>
<u></u>						
<u> </u>						
RCRA stat	us: N/A _	Generator	TSD _	Transporte	r Per	mitted ISD
		torage, and dispose egulated units.	sal procedures i	or hazardous w	astes generat	ed onsite and
201	RS ->	any oil t	akin to	AS-114,	Acto Ha	obby Shap
, .					- <del> </del>	/- 7



Describe Discolored Soil.

Location	Areal Size	Color	<u>Odor</u>	Source
				-

Stressed Vegetation:			
<u>Location</u>	Areal Size	Nature of Stress	Source
Odors:			
Location of Occurren	ice Des	cription	Source
	· · · · · · · · · · · · · · · · · · ·		
·			· · · · · · · · · · · · · · · · · · ·
Transformers:	,		
Manuf	acturer		
ID Nu			
Presen	ce of PCB labels		
Fluorescent Light Ballast	s:		
3	Presence of "No	PCB" labels	÷
•	Yes	No	
<b>.</b>			
Describe onsite debris and	l/or trash disposal are	eas:	
A TOS T	on	Contents	
Area ID or Locati			
Area 1D or Locati			
Area 1D or Locat			
Area 1D or Locat			
	or barriers on accessit	bility to onsite waste materia	als:
Describe any restrictions			•
Describe any restrictions	or barriers on accessil		•
Describe any restrictions	Jated acces	5.3	•

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Site Name:	 <del> </del>	
Site Number:	 	 
	-	

### WASTE SOURCE SUMMARY

Complete this portion of the checklist only after all available current and historic waste characteristics data have been gathered through the field reconnaissance and record search. Table 1 is designed to help you delineate site sources for scoring purposes.

For each source at the site, summarize in Table 1 (page 25):

- 1. Source Name
- 2. Source Type (according to Source Type Descriptions in PA Guidance, page A-6)
- 3. Size/volume/area of all features/structures that might contain hazardous waste
- 4. Estimated waste quantity as measured onsite or from record search
- 5. Types of hazardous substances handled
- 6. Condition/integrity of each storage disposal feature or structure
- 7. Sources of information for current site conditions and historical site conditions

and quantification (e.g., when waste sourc	information/clarification on waste source delineation e data is limited and the waste quantity is estimated cumentation of method and rationale is required):
-	

	Si	te Number:
GR <u>OUN</u> DWATER PATHWAY	<i>(</i>	
Groundwater at Site: (identif	_	t and usa)
•		
Durind water flow	is toward the	to Edwards Creek to
The North.		
units underlying the site		aracteristics of geologic/hydrogeologic
	Λ	Sufisine
Number of onsite drinking: _ sketch (page 22).	and monitoring:	Sufficient wells. Show locations on site
Obtain boring logs and well c	ompletion diagrams if av	ailable.
Source of Site Drinking Wate	r:	
Bottled Water:	Yes No	<u> </u>
Wells Onsite:	Yes No	· · · · · · · · · · · · · · · · · · ·
Public Water Supply:	Yes No	·
Name of Agency:	· · · · · · · · · · · · · · · · · · ·	Contact Person;
Other:		Phone Number:
Ann positive on singulation		durates?
•	i evidence of a release to	groundwater?
Describe:		
Source of information:		
Is a release to groundwater fr the following criteria and des	rom current or historic so scribe.)	ources suspected? (Base this judgment o
Are sources poorly cont	ained?	
4 lo		dwater contamination (e.g., wet lagoon)
• -		
	•	
is precipitation neavy?		

	Site Name:
	Site Number:
Is the site located in an area of kan	rst terrain?
Is the subsurface highly permeable	or conductive?
Is drinking water drawn from a sh:	allow aquifer?
Are suspected contaminants highly	mobile in groundwater?
Does analytical or circumstantial e	vidence suggest groundwater contamination?
Other criteria?	
· .	
ibe.)	
ibe.)	
ibe.) Is any drinking water well nearby?	
ibe.) Is any drinking water well nearby? Has any nearby drinking water wel	II been closed?
ibe.) Is any drinking water well nearby? Has any nearby drinking water wel Has any nearby drinking water use	ll been closed?  er reported foul-tasting or foul-smelling water?
ibe.) Is any drinking water well nearby? Has any nearby drinking water wel Has any nearby drinking water use Does any nearby well have a large Is any drinking water well located	Il been closed?  Treported foul-tasting or foul-smelling water?  drawdown or high production rate?  between the site and other wells that are suspected to
ibe.) Is any drinking water well nearby? Has any nearby drinking water wel Has any nearby drinking water use Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance?	Il been closed?  Treported foul-tasting or foul-smelling water?  drawdown or high production rate?  between the site and other wells that are suspected to
ibe.) Is any drinking water well nearby? Has any nearby drinking water wel Has any nearby drinking water use Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance?	Il been closed?  er reported foul-tasting or foul-smelling water?  drawdown or high production rate?  between the site and other wells that are suspected to evidence suggest contamination at a drinking water we
Is any drinking water well nearby? Has any nearby drinking water wel Has any nearby drinking water use Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance? Does analytical or circumstantial e	Il been closed?  er reported foul-tasting or foul-smelling water?  drawdown or high production rate?  between the site and other wells that are suspected to vidence suggest contamination at a drinking water we and sampling?
Is any drinking water well nearby? Has any nearby drinking water well Has any nearby drinking water use Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance? Does analytical or circumstantial e  Does any drinking water well warra	Il been closed?  er reported foul-tasting or foul-smelling water?  drawdown or high production rate?  between the site and other wells that are suspected to vidence suggest contamination at a drinking water we and sampling?
Is any drinking water well nearby? Has any nearby drinking water well Has any nearby drinking water use Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance? Does analytical or circumstantial e  Does any drinking water well warra	Il been closed?  er reported foul-tasting or foul-smelling water?  drawdown or high production rate?  between the site and other wells that are suspected to vidence suggest contamination at a drinking water we and sampling?
Is any drinking water well nearby? Has any nearby drinking water well Has any nearby drinking water use Does any nearby well have a large Is any drinking water well located exposed to a hazardous substance? Does analytical or circumstantial e  Does any drinking water well warra	vidence suggest contamination at a drinking water we ant sampling?

·	Site Name:
	Site Number:
	•
Determine the locations suspect have been expos	of and the number of people served by drinking water wells that you ed to hazardous substances from the site.
-	
<del></del>	
Discuss groundwater usa	age within four miles of the site.
Source of information:	
•	
Summarize the populati most boundary(ies) of the calculations in Table 3 (	on served by groundwater in the table below as measured from the outer he source(s) to drinking water supply wells. Provide apportionment (page 27) if applicable.
Dist.	
Distance (miles)	Population
0 - 1/4	
1/4 - 1/2	
1/2 - 1	
1 - 2	
2 - 3	
3 - 4	
Cauras of informations	
Source of information:	
What is the distance to	the nearest drinking water well?
mat is the distance to	the hearest trinking water wen.
Are any wellhead protec	ction areas present within 4 miles of the site?
irrigation, commercial l	rom wells within 4 miles of the site used for commercial food/forage cro ivestock water, ingredient in commercial food preparation, supply for or supply for a major water recreation area? Specify.

_	_		noff from the site.
Edwards Cru	k		
Discuss the probable surfac	-		
DEA(NASE)	FWALL TO NO	12 1 H + WES 1	
	·		
Provide a simplified sketch	of surface runoff an	d the surface-wate	er flow system for 15
stream miles (page 23). Ide			
Determine the average annu	val etraam flow of do	wastroom surfoca	water for 15 downstr
Water body:			
		Flow.	
Water body:		Flow:	
	•		
Water body:			
Water body:		Flow:	cfs
Source of information:			
Describe and locate on the (PPE) of potential hazardo	surface water feature us substance into a p	es map (page 23) tl erennial water bod	he probable point of o
(	<u></u>	VI VII VI VI VI VI VI VI VI VI VI VI VI	
Measure the shortest overla (if part of the migration pa	nd flow distance from	n any source to a p	erennial surface-wa
the overland measurement;	measure the course of	f water flow, not a	straight line).
Is the site or portions there	of located in surface	water?	
_NO			
	_		
What is the site flood frequ			

Site Number:

Site Name:		
Site Number:	· · · · · · · · · · · · · · · · · · ·	

Is the drainage area large?  Is rainfall heavy?  Is the infiltration rate low?  * Are sources poorly contained or prone to runoff or flooding?  * Is a runoff route well defined (e.g., ditch or channel leading to surface water)?  * Is vegetation stressed along the probable runoff route?  * Are sediments or water unnaturally discolored?  * Is wildlife unnaturally absent?  * Has deposition of waste into surface water been observed?  * Is groundwater discharge to surface water likely?	*	Is surface water nearby?
Is rainfall heavy?  Is the infiltration rate low?  Are sources poorly contained or prone to runoff or flooding?  Is a runoff route well defined (e.g., ditch or channel leading to surface water)?  Is vegetation stressed along the probable runoff route?  Are sediments or water unnaturally discolored?  Is wildlife unnaturally absent?  Has deposition of waste into surface water been observed?  Is groundwater discharge to surface water likely?  Does analytical or circumstantial evidence suggest surface-water contamination?  Other criteria?	*	Is waste quantity particularly large?
Is the infiltration rate low?  Are sources poorly contained or prone to runoff or flooding?  Is a runoff route well defined (e.g., ditch or channel leading to surface water)?  Is vegetation stressed along the probable runoff route?  Are sediments or water unnaturally discolored?  Is wildlife unnaturally absent?  Has deposition of waste into surface water been observed?  Is groundwater discharge to surface water likely?  Does analytical or circumstantial evidence suggest surface-water contamination?  Other criteria?	*	Is the drainage area large? YES
* Are sources poorly contained or prone to runoff or flooding?  * Is a runoff route well defined (e.g., ditch or channel leading to surface water)?  * Is vegetation stressed along the probable runoff route?  * Are sediments or water unnaturally discolored?  * Is wildlife unnaturally absent?  * Has deposition of waste into surface water been observed?  * Is groundwater discharge to surface water likely?  * Does analytical or circumstantial evidence suggest surface-water contamination?  * Other criteria?		Is rainfall heavy?
Is a runoff route well defined (e.g., ditch or channel leading to surface water)?  Is vegetation stressed along the probable runoff route?  Are sediments or water unnaturally discolored?  Is wildlife unnaturally absent?  Has deposition of waste into surface water been observed?  Is groundwater discharge to surface water likely?  Does analytical or circumstantial evidence suggest surface-water contamination?  Other criteria?		Is the infiltration rate low?
* Is vegetation stressed along the probable runoff route?  Are sediments or water unnaturally discolored?  * Is wildlife unnaturally absent?  * Has deposition of waste into surface water been observed?  * Is groundwater discharge to surface water likely?  * Does analytical or circumstantial evidence suggest surface-water contamination?  * Other criteria?	*	Are sources poorly contained or prone to runoff or flooding?
* Is vegetation stressed along the probable runoff route?  Are sediments or water unnaturally discolored?  * Is wildlife unnaturally absent?  * Has deposition of waste into surface water been observed?  * Is groundwater discharge to surface water likely?  * Does analytical or circumstantial evidence suggest surface-water contamination?  * Other criteria?	*	Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
* Are sediments or water unnaturally discolored?  * Is wildlife unnaturally absent?  * Has deposition of waste into surface water been observed?  * Is groundwater discharge to surface water likely?  * Does analytical or circumstantial evidence suggest surface-water contamination?  * Other criteria?	*	
* Has deposition of waste into surface water been observed?  * Is groundwater discharge to surface water likely?  * Does analytical or circumstantial evidence suggest surface-water contamination?  * Other criteria?	*	
* Has deposition of waste into surface water been observed?  * Is groundwater discharge to surface water likely?  * Does analytical or circumstantial evidence suggest surface-water contamination?  * Other criteria?	*	
* Is groundwater discharge to surface water likely?  * Does analytical or circumstantial evidence suggest surface-water contamination?  * Other criteria?	*	
* Does analytical or circumstantial evidence suggest surface-water contamination?  * Other criteria?	*	
* Other criteria?		Is groundwater discharge to surface water likely?
	*	
	*	Does analytical or circumstantial evidence suggest surface-water contamination?
	*	Does analytical or circumstantial evidence suggest surface-water contamination?
	*	Does analytical or circumstantial evidence suggest surface-water contamination?
	*	Does analytical or circumstantial evidence suggest surface-water contamination?
	*	Does analytical or circumstantial evidence suggest surface-water contamination?
	*	Does analytical or circumstantial evidence suggest surface-water contamination?  Other criteria?
	*	Does analytical or circumstantial evidence suggest surface-water contamination?  Other criteria?
Do any primary surface-water targets exist? (Base this judgment on the following criteria and describe.)	* *	Does analytical or circumstantial evidence suggest surface-water contamination?  Other criteria?  Do any primary surface-water targets exist? (Base this judgment on the following criteria and
describe.)	d	Does analytical or circumstantial evidence suggest surface-water contamination?  Other criteria?  Do any primary surface-water targets exist? (Base this judgment on the following criteria and lescribe.)
* Is any target nearby? If yes, specify below:	d	Does analytical or circumstantial evidence suggest surface-water contamination?  Other criteria?  Do any primary surface-water targets exist? (Base this judgment on the following criteria and lescribe.)  Is any target nearby? If yes, specify below:
describe.)	d	Does analytical or circumstantial evidence suggest surface-water contamination?  Other criteria?  Do any primary surface-water targets exist? (Base this judgment on the following criteria and lescribe.)  Is any target nearby? If yes, specify below:
* Is any target nearby? If yes, specify below:	d	Does analytical or circumstantial evidence suggest surface-water contamination?  Other criteria?  Do any primary surface-water targets exist? (Base this judgment on the following criteria and lescribe.)  Is any target nearby? If yes, specify below:  Drinking water intake

\	Has any intake, fishery, or recreational area been closed?
	Does analytical or circumstantial evidence suggest surface-water contamination at or downstream of a target?
	Does any target warrant sampling? If yes, specify below:
	Drinking water intake
	Fishery
	Sensitive environment
	Sensitive environment Other criteria?
	Other criteria?  Primary intake(s) identified?  Primary fisher(ies) identified?
	Primary fisher(ies) identified?
	Primary sensitive environment(s) identified?
— So	urce of information:
Ar	
Arwe	urce of information:  e any intakes part of a blended water supply system, and if so, how many other intakes or
Arwe	urce of information:  e any intakes part of a blended water supply system, and if so, how many other intakes or lls supply the same system?
Ar we	e any intakes part of a blended water supply system, and if so, how many other intakes or lls supply the same system?  at is the distance to the nearest drinking water intake?
Ar we	e any intakes part of a blended water supply system, and if so, how many other intakes or lls supply the same system?  at is the distance to the nearest drinking water intake?
Ar we	e any intakes part of a blended water supply system, and if so, how many other intakes or lls supply the same system?  at is the distance to the nearest drinking water intake?
Ar we Wi	e any intakes part of a blended water supply system, and if so, how many other intakes or lls supply the same system?  at is the distance to the nearest drinking water intake?
Ar we Wi	e any intakes part of a blended water supply system, and if so, how many other intakes or lls supply the same system?  nat is the distance to the nearest drinking water intake?  scribe and locate fisheries within 15 downstream miles of the site.

	Site Name:
	Site Number:
Describe any sensitive environments ( stream miles of the site.	PA Guidance, PA Table 5, page A-31) within 15 down-
Measure the total length (or frontage stream mile target distance limit of the	) of wetlands adjacent to surface water along the 15 down- he site.
	· · · · · · · · · · · · · · · · · · ·

Describe known surficial (within 2 feet of sursite.	face) areas of c	ontaminatio	n on or adjacent t
Mone known			
		•	
* Visual evidence of run-on/runoff?	Yes	No	
* Visual signs of contaminated run-on/runoff?	Yes	No	_
Description and direction of site runoff:			
•			
Surface-water run-on from neighbor's proper potential).	ty (identify sou	rce direction	s and contaminati
Surface-water run-on from neighbor's proper potential).	ty (identify sou	rce direction	s and contaminati
potential).	ty (identify sou	rce direction	s and contaminati
Surface-water run-on from neighbor's proper potential).  Determine if a resident population for the soil the following criteria. Describe.			
Determine if a resident population for the soil	exposure path	way can be id	dentified on the b
Determine if a resident population for the soil the following criteria. Describe.  Is any residence, school, or daycare faci	exposure path lity on or withing of the lity located on :	way can be identification of the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second seco	dentified on the b
Determine if a resident population for the soil the following criteria. Describe.  Is any residence, school, or daycare faci contamination?  Is any residence, school, or daycare faci leased by the site owner/operator?	l exposure path lity on or within OC lity located on :	way can be in 200 feet of adjacent land	dentified on the b f an area of suspec d previously owne
Determine if a resident population for the soil the following criteria. Describe.  Is any residence, school, or daycare faci contamination?  Is any residence, school, or daycare faci leased by the site owner/operator?	lity on or withing of the lity located on a concept of the located and the located and the located hazardous lents reported a	way can be in 200 feet of adjacent land substances numbers diverse health	dentified on the b f an area of suspect d previously owner tear residences, so
Determine if a resident population for the soil the following criteria. Describe.  Is any residence, school, or daycare faci contamination?  Is any residence, school, or daycare facileased by the site owner/operator?  Is there a migration route that might spin or daycare facilities?  Have onsite or adjacent residents or students.	lity on or withing of the lity located on a read hazardous lents reported a ation problems:	way can be in 200 feet of woo ff	dentified on the b f an area of suspect d previously owner tear residences, so
Determine if a resident population for the soil the following criteria. Describe.  Is any residence, school, or daycare faci contamination?  Is any residence, school, or daycare facileased by the site owner/operator?  Is there a migration route that might spin or daycare facilities?  Have onsite or adjacent residents or studiapparent drinking water or air contamin	lity on or withing of the lity located on a common constant of the lity located and the lity located a common problems and the lity located a common problems and lity located a common problems and lity located a common problems and lity located a common problems and lity located a common control lity located a common problems and lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity located a common control lity lity located a common control lity lity located a common control lity lity lity lity lity lity located a common control lity lity lity lity lity lity lity lit	way can be in 200 feet of woo ff	dentified on the b f an area of suspect d previously owner lear residences, sc h effects, exclusiv

Site Name: Site Number:

÷	Site Name:
	Site Number:
	Resident population identified?
Dete 200	rmine the number of people occupying residences or attending school or daycare on or with feet of areas of suspected contamination.
Is th	e facility active? Hs
	s, how many workers? 2 fell-fine
How	many workers are employed at offsite facilities with suspected contamination?
Desc of su	ribe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) on an a spected contamination.
comi	commercial agriculture, commercial silviculture, commercial livestock production, or nercial livestock grazing present on areas of suspected contamination? Specify.
	rmine the population (those who live, work, or attend school) within 1 mile of suspected
Dete surfi	cial contamination.

Site Name: _	
Site Number:	

#### AIR PATHWAY

Describe current or historic sources for which migration of hazardous substances to the air pathway could occur.

None known

Is a release of hazardous substances to the air pathway suspected? (Base judgment on the following criteria and describe.)

Are odors currently reported or have they been reported in the past?

Has release of a hazardous substance to the air been directly observed?

Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?

Does analytical or circumstantial evidence suggest a release to the air?

Other criteria?

Suspected release?

Summarize the population within a four-mile radius of the site.

Distance (miles) Population

* Onsite

* 0 - 1/4

1/4 - 1/2

1/2 - 1

1 - 2

2 - 3

3 - 4

Site Name:	
Site Number:	<del></del>
st individual can be a worker, resident, or student. Measure	
	thin 0
i	

Site Name: _	
Site Number:	

## **General Comments**

Describe any additional information collected and clarify any issues previously addressed. Use this space to document any assumptions made for scoring purposes, and the rationale behind those assumptions.

	CNLY STORA	GE ALEA FOR	ES CIPARNT	INCLOONE
	SH-RACK + C	JWS CN-SITE,	WOLKER	IN ENTONE
- 8				-
	· · · · · · · · · · · · · · · · · · ·			
				<del></del>
				······································
				·

<u>REFERENCES</u>				•
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	•		· · · · ·	
-		-		

INTERVIEWS	
·	
*	
<u> </u>	

Site Name: _	 <del></del>
Site Number:	 

## * Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.

	· · · · · · · · · · · · · · · · · · ·			N †
		,		
	·			
			·	
				·

Site Name: _	
Site Number:	

### Surface-Water Features

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

	•				¥	N †
		·		,		•
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			•			
	•					
			,			
	•					
			·			
	-					

Site Name: _	AS119	
Site Number:		

# Photo Log

Photo Number	Description of Location	Looking Which Direction	Comments
57 1 B	SOUTH-SIDE	WETT TO AST	(AST)
Zuld	WEST - 510E	NO RTH	WASHRACK/OWLS
3 45	WEST - 810E		
4 uv	SAST- SIDE	NORTH-WEST	
3 41	NORTH SIDE	500 74 - NEST	3 8A73
1 48	STERAGE BAYS	50674	
93 7 49	CONTAINER 5	<del>-</del>	OUMPSTERS
•	(EASTERN	107)	

Table 1: Source Summary¹

Source	Source Tune	Sizo	Estimated			Sources of I	nformation
Name	Source Type (PA Guidance, page A-6)	Size (volume/area)	Estimated Waste Quantity	Specific Compounds	Containment ²	Current	Historical
		,					,

Use additional sheets if necessary.

Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

Table 2: Hydrogeologic Information 1

Strata Name/Description	Thickness (feet)	Hydraulic Conductivity (cm/sec)	Type of Discontinuity ²	Source of Information
		:		
				,

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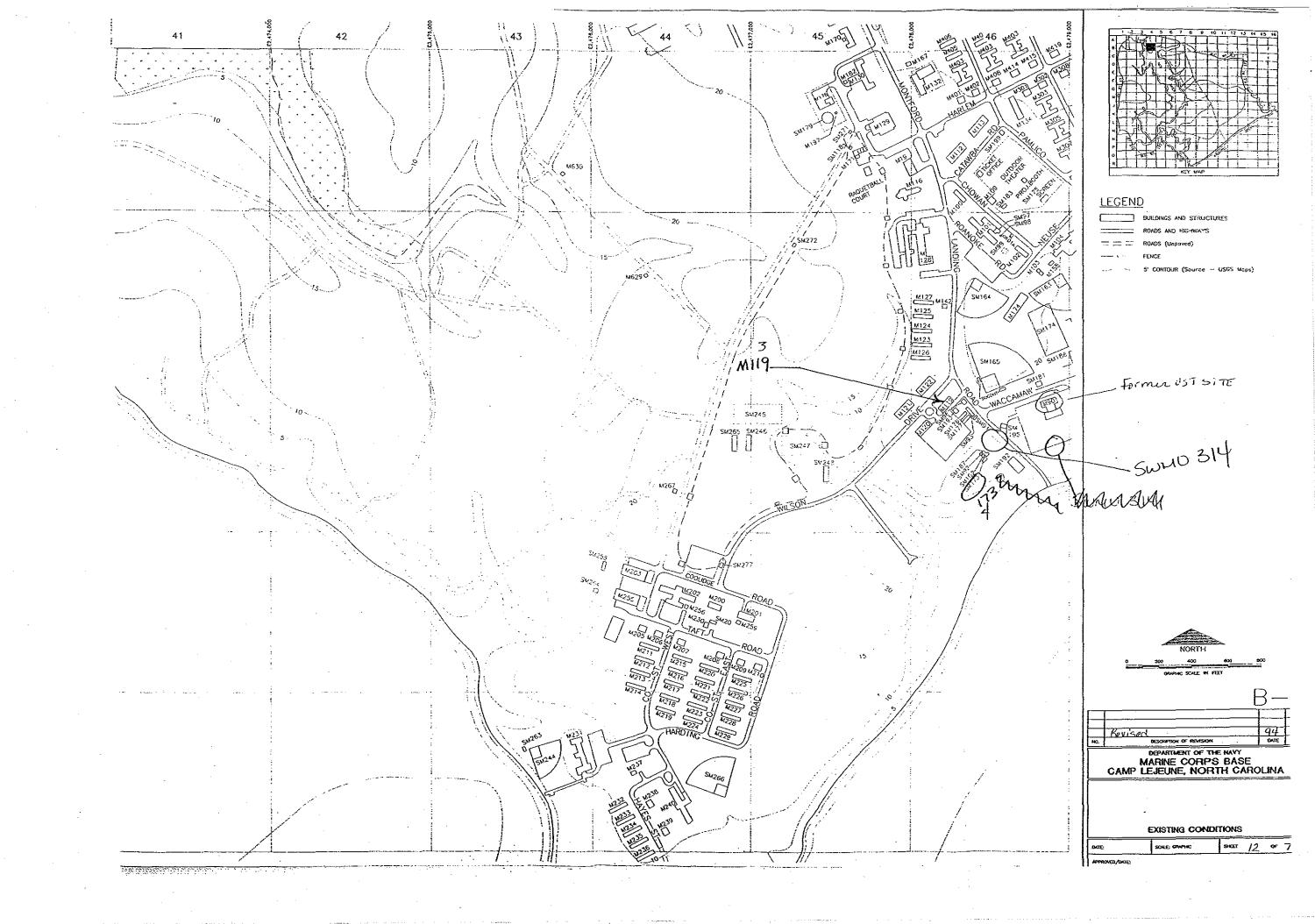
¹ Use additional sheets if necessary.

2 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

Table 3: Apportionment Calculations for Drinking Water Wells¹

Distance Category (miles)	Well Number	Well Name	System	Population Served by System	Total Wells Supplying System	Population Served by Well	Total Population Served for Distance Category
1/4 - 1/2							
1/2 - 1							<u> </u>
1 - 2							· · · · · · · · · · · · · · · · · · ·
2 - 3							
3 - 4							

¹ See PA Guidance, pages 63 and 64 for additional guidance on apportionment.



# MONTFORD POINT

M119

Site Name: _	<u> 4119</u>	 <del></del>
Site Number:		 

## PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

Name and Title of Inspector:	Date:
	Time:
2	
	19 is located in the area of Hontford
Approximate Area of Site (acres or square	e feet): Lingth 153'x Width 46' = 6,118's
Direction to Site (from nearest public road	d): This building is located toward
Therend of Montford Landi	ng Road, past wilson Drive towar
The New River.	d): This building is located toward ng Road, past wilson Drive toward
·	
Name and Position of Site Contact:	
Telephone Number:	
Weather Conditions:	
Describe Surrounding Land Use North	th: Industrial
Adjacent to the Site Sout	th:
East	
Wes	.17
Present Uses of Site: Agricultu	ural Commercial
Industria	d Undeveloped
Resident	ial
2	
	utomotine Vehicle Maintenance St
· Na+01	ac or site at line of visit

Indicates Field/Record Search Task

FORMS(6) - Fid-Insp 0402041492

		Site Nam	ue:
		Site Num	aber:
Former Uses of Site:	Agriculto	al	Commercial Undeveloped
Describe uses and len 1945 - Gara 1988 - Venic	gths of time. 194 ge 1951-7 Le Maintena	13-Building 1 6 School / 1 ce Shop 190	Comstructed, Classhed Applied unstruction Bui 31- Driving School
	and the second second		f processes and hazardous
Saftey Klun Poorts Cleani	Solunt, wa	aste Oil, Ve	hicle Repair Celated,
	<i>O</i>		
Is site used by Own	•		
Is site used by Own	er or Ter	nants	Length of Time Used
Is site used by Own	er or Ter	nants	
Is site used by Own Name of Tens	er or Ter	Type of Use	
Name of Tenz	er or Ter	Type of Use  Type of existing struction	Length of Time Used
Is site used by Own  Name of Tenz  Describe the number,	size, shape, and use	Type of Use  of existing structures and the structures are structures as the structure and the structures are structures as the structure and the structures are structures as the structure and the structures are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures as the structure are structures	Length of Time Used

Туре		Agency	•	Expiration Date
		1110		
escribe any emergency	or remedial act	tions that have	occurred at the s	ite.
				· · · · · · · · · · · · · · · · · · ·
ource of information:				
ource or information.				
Discuss existing sampling	g data and brie	fly summarize	data quality (e.g.	, sample objective,
ge/comparability, analy			,	
There is a Sw	MU #314	in the a	rea of this	structure. I
There is a Sw	MU #314 MW UST	in the a Site locat	ua of this	structure. I
There is a Sw is also a for	MU #314 MW UST	in the a Site locat	ua of this ed at buil	structure. T ding M-90
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	· · · · · · · · · · · · · · · · · · ·	in the a Site locat	rea of this	structure. T
	nt: em: Domestic	Yes	rea of this red at buil	structure. T
Vaste Water Managemei	nt: em: Domestic			structure. T
Vaste Water Managemei	nt: em: Domestic Industrial	Yes Yes	No No	structure. T
/aste Water Managemen Onsite Septic Syste	nt: em: Domestic Industrial	YesYes	No No	Structure. T
Vaste Water Managemen Onsite Septic Syste Public Sewer:	nt: em: Domestic Industrial Domestic Industrial	Yes Yes Yes Yes	No No No	structure. T
Public Sewer:  Name of Agency:	nt:  em: Domestic Industrial  Domestic Industrial	Yes Yes Yes Yes	No No No No Contact Person	1
Vaste Water Managemen Onsite Septic Syste Public Sewer:	nt:  em: Domestic Industrial  Domestic Industrial	Yes Yes Yes Yes	No No No No Contact Person	
Vaste Water Management Onsite Septic Syste Public Sewer: Name of Agency: Other:	nt:  Domestic Industrial  Domestic Industrial	Yes Yes Yes Yes	No No No No Contact Person	1
Vaste Water Management Onsite Septic Syste Public Sewer:  Name of Agency: Other:	nt:  em: Domestic Industrial  Domestic Industrial	YesYesYes	No No No Contact Person Phone Number	1
Vaste Water Management Onsite Septic Syste Public Sewer:  Name of Agency: Other:	nt:  em: Domestic Industrial  Domestic Industrial  ter treatment sy	Yes Yes Yes Yes Yes	No No No Contact Person Phone Number	1

FORMS(6) - Fld-Insp 0402041492 Site Number:

		Site Name:
		Site Number:
		WASTE CHARACTERISTICS
K	*	Describe underground tanks onsite and identify on site sketch.  Type and could wested was to be at Detection/ Secondary Registered  Tank ID Capacity Contents Age Location Containment Y N
		Location Containment Y N  Location Containment Y N
		100000000000000000000000000000000000000

* Describe underground hazardous material piping systems at the site and identify on site sketch.

Location	Type of Pipe	Age	Type of <u>Hazardous Material</u>
<del>-</del>			

* Describe aboveground tanks onsite and identify on site sketch.

	Tank ID	Type and Capacity	Contents Full Oil	Age	<u>Location</u>	Leak Detection/ Secondary Containment	Registered Y N N/A
120 <	<u>(4)</u> (	g zergel	01386 Feel c/1	NEW	WEST-SIME SOUTH MUD	7:5/1/1) nc	n k

Area ID	Paved	Containment	No., Size, and Type of Containers		Contents	Evider Rele
-						·
List hazard	lous materi	als used onsite.				
	Name	of Material		No. and	Size of Conta	iners
<del></del>	<u> </u>	SEL /ACLS		<del></del>	~	
	·		<del></del>			
<del></del>	<u> </u>					<del></del>
RCRA stat	us: N/A _	Generator	TSD _	Transporte	r Per	rmitted l
•						
Describe tr	eatment, s	Generator torage, and dispo				
Describe tr	eatment, s	torage, and dispo egulated units.				
Describe tr	reatment, s y RCRA-r	torage, and dispo egulated units.				
Describe tr	reatment, s y RCRA-r	torage, and dispo egulated units.				
Describe tr	reatment, s y RCRA-r	torage, and dispo egulated units.				
Describe tr identify an	reatment, si	torage, and dispo				
Describe tr	reatment, si	torage, and dispo				

Stressed Vegetation:	Areal Size	Nature of Stress	Sourc
Docution	Alcai Olec	Tractare of Otress	
			-
Odors:			
Location of Occurrence	e Desc	ription	Source
	,		
Transformers:			
Manufac	cturer		
ID Numl			,
•	of PCB labels		•
Fluorescent Light Ballasts:			
	Presence of "No	PCB" labels	
	Yes N	No	*
Describe and Jakob 17			
Describe onsite debris and/	or trash disposat are:	as.	
Area ID or Location	0	Contents	
	<u> </u>		
Describe any restrictions or	barriers on accessibi	ility to onsite waste mater	ials:
	-		<u>.</u>
•			
Describe any signs of unaut			

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0402041492

Site Name:

	Site Name:
	Site Number:
KASTE SOURCE SUMMARY	
NOTE OUNCE DOMINART	
Complete this portion of the checklist only after all characteristics data have been gathered through the Fable 1 is designed to help you delineate site sources	field reconnaissance and record search.
For each source at the site, summarize in Table 1 (p	age 25):
1. Source Name	
2. Source Type (according to Source Type Des	criptions in PA Guidance, page A-6)
3. Size/volume/area of all features/structures	that might contain hazardous waste
4. Estimated waste quantity as measured onsit	e or from record search
5. Types of hazardous substances handled	
6. Condition/integrity of each storage disposa	feature or structure
7. Sources of information for current site cond	litions and historical site conditions
In the space below provide any additional information and quantification (e.g., when waste source data is libigh for conservative scoring purposes, documentation	imited and the waste quantity is estimated

	Site Name:
	Site Number:
GROUNDWATER PATHWAY	
Groundwater at Site: (identify depth,	, quality, gradient, and use)
Connedwater Plan ins	neth towards the new hime
Diaz cas	
In Table 2 (page 26), give names, descurits underlying the site.	scriptions, and characteristics of geologic/hydrogeologic
Number of onsite drinking:	and monitoring: Ser by wells. Show locations on site
Obtain boring logs and well completion	on diagrams if available.
Source of Site Drinking Water:	
Bottled Water: Yes _	No
Wells Onsite: Yes _	No
Public Water Supply: Yes _	No
Name of Agency:	Contact Person;
Other:	Phone Number:
Any positive or circumstantial evidence	ce of a release to groundwater?
Describe:	
Source of information:	. ,
-	
	rent or historic sources suspected? (Base this judgment on
the following criteria and describe.)	
Are sources poorly contained?	- no
Is the source a type likely to con	ontribute to groundwater contamination (e.g., wet lagoon)?
NO.	·
·	arge?
<b>'</b>	
Is the infiltration rate high?	

•	Site Number:
Is the site located in an area of karst terrain	n? Nefer to
Is the subsurface highly permeable or condu	
Is drinking water drawn from a shallow aqu	ifer?
Are suspected contaminants highly mobile i	n groundwater?
Does analytical or circumstantial evidence s	uggest groundwater contamination?
Other criteria?	
ibe.) Is any drinking water well nearby?	
Has any nearby drinking water well been cl	
Has any nearby drinking water user reporte	
Does any nearby well have a large drawdow	<del>_</del>
Is any drinking water well located between exposed to a hazardous substance?	the site and other wells that are suspected to
Does analytical or circumstantial evidence s	uggest contamination at a drinking water we
Does any drinking water well warrant samp	ling?
Other criteria?	
	•

	Site Name:
	Site Number:
	•
Determine the locations of and the number suspect have been exposed to hazardous su	r of people served by drinking water wells that you abstances from the site.
Discuss groundwater usage within tour mil	les of the site.
`	· · · · · · · · · · · · · · · · · · ·
Source of information:	
	idwater in the table below as measured from the oute
calculations in Table 3 (page 27) if applications	nking water supply wells. Provide apportionment able.
Distance	
(miles) Population	<del></del>
0 - 1/4	
1/4 - 1/2	
1/2 - 1	
1 - 2	
2 - 3	
3 - 4	
3 - 4	
S'a	
Source of information:	
1977	
What is the distance to the nearest drinking	ag water well?
As-	
•	•
Are any wellhead protection areas present	within 4 miles of the site?
· ·	
is groundwater drawn from wells within 4 trigation, commercial livestock water, ing	miles of the site used for commercial food/forage cr redient in commercial food preparation, supply for
commercial agriculture, or supply for a ma	ajor water recreation area? Specify.
- and	and the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of t
<del></del>	

Acoust water budge	. He and Bries	
Michael William	is the new river	
	off patterns from the site to surface waters.	
south to New	- River, perking lot => drage	rff i
Provide a simplified sketch of su stream miles (page 23). Identify	rface runoff and the surface-water flow system which water courses are overland, intermittent,	for 15 or pei
	ream flow of downstream surface water for 15 d	ownstr
Water body:		
Water body:	Flow: cfs	
Water body:		
Water body:	Flow: cfs	
Water body:	Flow: cfs	
Source of information:		<u> </u>
(PPE) of potential hazardous sul	ce water features map (page 23) the probable pobstance into a perennial water body.	oint of
Measure the shortest overland fle (if part of the migration pathwa	ow distance from any source to a perennial surfa y is via intermittent drainages, include these dra	ice-wa inages
the overland measurement; measurement	ure the course of water flow, not a straight line)	) <b>.</b>
Is the site or portions thereof loc	ated in surface water?	

FORMS(6) - Fld-Insp 0402041492 Site Name: __ Site Number:

*	Is surface water nearby?	3
*	Is waste quantity particularly large?	
ŧ	Is the drainage area large?	<u> </u>
	Is rainfall heavy?	
	Is the infiltration rate low?	
k	Are sources poorly contained or prone to runoff	or flooding?
k	Is a runoff route well defined (e.g., ditch or cha	nnel leading to surface water)?
k	Is vegetation stressed along the probable runoff	*
ŧ	Are sediments or water unnaturally discolored?	10
ķ	Is wildlife unnaturally absent?	
ŧ .	Has deposition of waste into surface water been	observed?
k	Is groundwater discharge to surface water likely	? <u>yes</u>
ķ	Does analytical or circumstantial evidence sugge	· ·
Ŀ	Other criteria?	
		· · · · · · · · · · · · · · · · · · ·
	Do any primary surface-water targets exist? (Base th describe.)	is judgment on the following criteria
	Is any target nearby? If yes, specify below:	
:	· , · .	
	Fishery NEW LIVEK Sensitive environment	

Site Number:

	Does analytical or circumstantial evidence suggest surface-water contamination at or downstream of a target?
	Does any target warrant sampling? If yes, specify below:
	Drinking water intake
	Fishery
	Sensitive environment
	Other criteria?
•	Primary intake(s) identified?
	Primary fisher(ies) identified?
	Primary sensitive environment(s) identified?
	ream miles of the site.
So	ource of information:
So	ource of information:  re any intakes part of a blended-water supply system, and if so, how many other intakes of ells supply the same system?
So	ource of information:  re any intakes part of a blended-water supply system, and if so, how many other intakes o
So	ource of information:  re any intakes part of a blended water supply system, and if so, how many other intakes of ells supply the same system?
Solution	ource of information:  re any intakes part of a blended water supply system, and if so, how many other intakes of ells supply the same system?
Solution	ource of information:  re any intakes part of a blended water supply system, and if so, how many other intakes cells supply the same system?  That is the distance to the nearest drinking water intake?
So Ai	ource of information:  re any intakes part of a blended water supply system, and if so, how many other intakes cells supply the same system?  That is the distance to the nearest drinking water intake?

Site Name: ______
Site Number:

	Site Name:
	Site Number:
Describe any sensitive environm stream miles of the site.	ents (PA Guidance, PA Table 5, page A-31) within 15 down-
Measure the total length (or fro stream mile target distance limi	of the site.
•	

	Site Name:
	Site Number:
SOIL EXPOSURE PATHWAY	
Describe known surficial (within 2 feet of surf	ace) areas of contamination on or adjace
None known	
* Visual evidence of run-on/runoff?	Yes No
* Visual signs of contaminated run-on/ runoff?	Yes No
Description and direction of site runoff:	
Surface-water run-on from neighbor's propert	y (identify source directions and contami
Surface-water run-on from neighbor's property potential).	y (identify source directions and contami
	y (identify source directions and contami
	y (identify source directions and contami
Determine if a resident population for the soil	exposure pathway can be identified on thity on or within 200 feet of an area of su
Determine if a resident population for the soil the following criteria. Describe.  Is any residence, school, or daycare facili	exposure pathway can be identified on the ity on or within 200 feet of an area of su
Determine if a resident population for the soil the following criteria. Describe.  Is any residence, school, or daycare facilic contamination?	exposure pathway can be identified on the ity on or within 200 feet of an area of suity located on adjacent land previously over a can be identified on the ity located on adjacent land previously over a can be identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the
Determine if a resident population for the soil the following criteria. Describe.  Is any residence, school, or daycare facilic contamination?  Is any residence, school, or daycare facilic leased by the site owner/operator?  Is there a migration route that might spreador.	exposure pathway can be identified on the ity on or within 200 feet of an area of suity located on adjacent land previously over a can be identified on the ity located on adjacent land previously over a can be identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on adjacent land previously on the identified on adjacent land previously on the identified on identified on the identified on identified on identified on the identified on the identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified
Determine if a resident population for the soil the following criteria. Describe.  Is any residence, school, or daycare facilic contamination?  Is any residence, school, or daycare facilic leased by the site owner/operator?  Is there a migration route that might sprear daycare facilities?	exposure pathway can be identified on the ity on or within 200 feet of an area of suity located on adjacent land previously over a can be identified on the ity of the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on the identified on adjacent land previously over the identified on adjacent land previously over the identified on adjacent land previously over the identified on adjacent land previously over the identified on adjacent land previously over the identified on adjacent land previously over the identified on adjacent land previously over the identified on adjacent land previously over the identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on identified on i

	Site Name:
	Site Number:
	Resident population identified?
Detei 200 f	rmine the number of people occupying residences or attending school or daycare on or withing et of areas of suspected contamination.
Is the	e facility active? <u></u>
	s, how many workers?
How	many workers are employed at offsite facilities with suspected contamination?
Desci of su	ribe any terrestrial sensitive environments (PA Guidance, PA Table 7, page A-39) on an arspected contamination.
Are c	commercial agriculture, commercial silviculture, commercial livestock production, or nercial livestock grazing present on areas of suspected contamination? Specify.
	rmine the population (those who live, work, or attend school) within 1 mile of suspected cial contamination.
	•

Site Name: _	
Site Number:	

### AIR PATHWAY

Describe current or historic sources for which migration of hazardous substances to the air pathway could occur.

Vm. known

Is a release of hazardous substances to the air pathway suspected? (Base judgment on the following criteria and describe.)

*

Are odors currently reported or have they been reported in the past?

Has release of a hazardous substance to the air been directly observed?

Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?

Does analytical or circumstantial evidence suggest a release to the air?

Other criteria?

Suspected release?

Summarize the population within a four-mile radius of the site.

(miles)	Population
* Onsite	
* 0 - 1/4, ,	
1/4 - 1/2	
1/2 - 1	
1 - 2	
2 - 3	
	. \

	Site Name:
	Site Number:
the nearest individual.	from the outer boundary of the sources available to the air pathway to (Nearest individual can be a worker, resident, or student. Measure from air sources to the building occupied by the nearest individual.)
Identify and locate any to 1/4 mile and 1/4 to	sensitive environments (PA Guidance, PA Table 5, page A-31) within 0 1/2 mile of the site.

		Site Numbe	r:	
General Comments		•		
Describe any additiona his space to document hose assumptions.	l information collected any assumptions made	l and clarify any e for scoring purp	issues previously adooses, and the ration	ldressed. Use nale behind
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Site Name:

REFERENCES				
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INTERVIEWS					
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Site Name:	
Site Number:	

## Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.

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Site Name:	<del></del>
Site Number:	

### Surface-Water Features

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

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		'
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Site Name:	4119	 
Site Number	•	

*

Photo Log

Photo Number	Description of Location	Looking Which Direction	Comments
\$ 581 50	south side	north-cast	boyslottia
2 51	wistmide	nerth rear	Art /Pao
3 52	north-side	south-east	any a long of sec
5714 53	en la side	w.o.	* Administrative

[	Source	Sauraa Tura	Sizo	Estimated			Sources of I	nformation
	Name	Source Type (PA Guidance, page A-6)	Size (volume/area)	Waste Quantity	Specific Compounds	Containment ²	Current	Historical
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Use additional sheets if necessary.
 Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

Table 2: Hydrogeologic Information¹

Strata Name/Description	Thickness (feet)	Hydraulic Canductivity (cm/sec)	Type of Discontinuity ²	Source of Information

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¹ Use additional sheets if necessary.
2 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

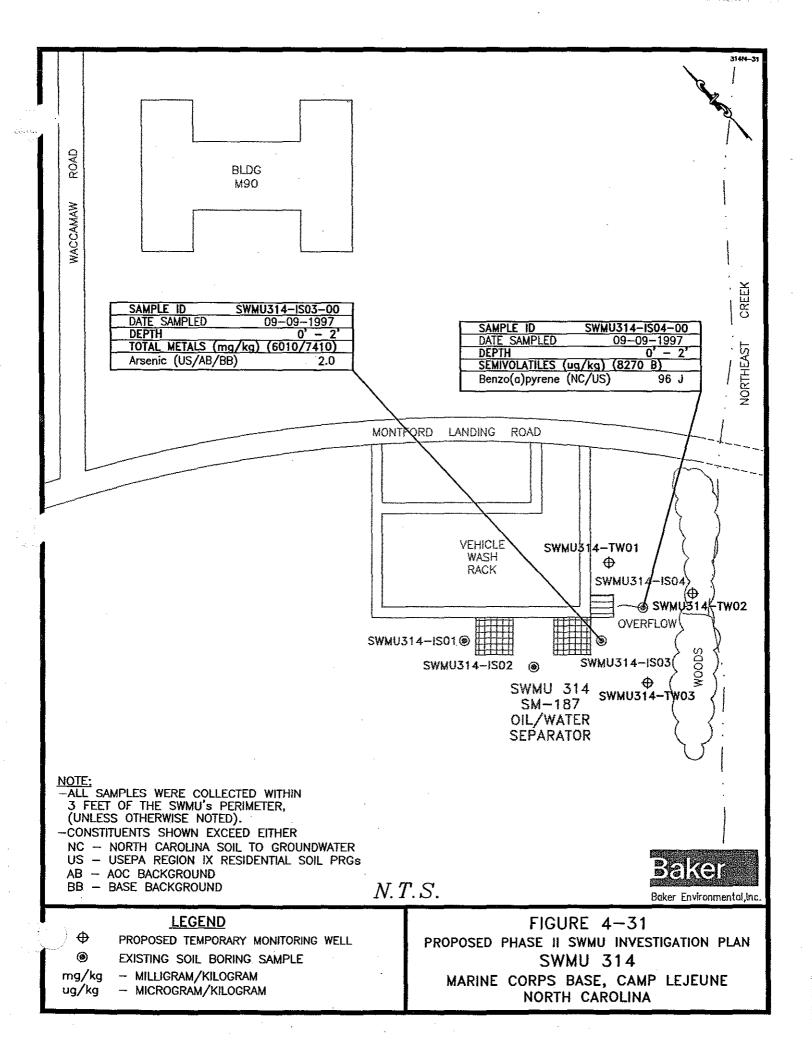
Table 3: Apportionment Calculations for Drinking Water Wells¹

Distance Category (miles)	Well Number	Well Name	System	Population Served by System	Total Wells Supplying System	Population Served by Well	Total Population Served for Distance Category
0 - 1/4							
1/4 - 1/2							
1/2 - 1							
1 - 2							
2 - 3							
3 - 4							

¹ See PA Guidance, pages 63 and 64 for additional guidance on apportionment.

# **MONTFORD POINT**

**SM173** 



Site Name: _	SM173
Site Number:	

# PRELIMINARY ASSESSMENT FIELD INSPECTION CHECKLIST

me and Title of Inspector:		Date:	
		Time:	_ <del></del> ,
ito Togotion / Addison - CAJI 73	3 in ladated	lim to Mantonio Onint Man	· 4
Camp Lieure, niin	ally it was	sa small shed to house a	stea
Approximate Area of Site (acres or	square feet): 1	14'x10'=140cg.ft	<u></u> -
Direction to Site (from nearest pub	olic road): Cus	rently, used to wash we	hic
and has a concrete	wash sac	h. This ous is atown	ol 5
end 4 Montford Lar	ding Road	untry, used to wast ve h. This ous is atown	<del> </del>
0	<u> </u>		
Describe Surrounding Land Use Adjacent to the Site			
	South:		
	West:		
Present Uses of Site: A	gricultural	Commercial	
In	dustrial	Undeveloped	
	esidential	• • • • • • • • • • • • • • • • • • • •	
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Describe use. <u>Airrently</u>	a whice	wash rack	
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ndicates Field/Record Search Tas	<b>k</b>	JOST 200 11 11 11 11 11 11 11 11 11 11 11 11 1	47
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		ations of where this strush she rack is on the figure	4

				Site Number:	
For	rmer Uses of Site:		Agricultural Industrial Residential		Commercial Undeveloped
	scribe uses and len			•	ashed to house a
For ma	r former industrial terials utilized. Sham Ju	and comm	ercial uses, descri		
Is s	site used by Own	er	or Tenants	of Use	Length of Time Used
	ige 22).	;	e, and use of exis		dicate locations on site ske

Type		Agency		Expiration Date
•				
escribe any emergency	or remedial action			
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ource of information:				
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Vaste Water Manageme Onsite Septic Syste Public Sewer: Name of Agency:	ent:  em: Domestic Ye Industrial Ye Industrial Ye	es No es No es No con Co	oooo oontact Person	
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Site Name: ____

Site	Name:		
Site	Number	•	<u></u>

## **WASTE CHARACTERISTICS**

* Describe underground tanks onsite and identify on site sketch.

	none 1	known			Leak Detection/	
Tank ID	Type and Capacity	<u>Contents</u>	Age	Location	Secondary Containment	Registered Y N
		<del></del>				
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* Describe underground hazardous material piping systems at the site and identify on site sketch.

Location	Type of Pipe	Age	Type of <u>Hazardous Material</u>
		<del></del>	

*	*	Des
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Describe aboveground tanks onsite and identify on site sketch.

	ina mi	ourc			Detection/		
Tank ID	Type and Capacity	Contents	_Age_	Location	Secondary Containment	Registered Y N N/A	
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			-				
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Site Name:	
Site Number:	

*	Describe container	storage	areas and	identify	on site	sketch.
---	--------------------	---------	-----------	----------	---------	---------

Area ID	Paved	Containment	No., Size, and Type of Containers	Condition of Containers	Contents	Evidence of Release
	·		<del></del>		<del></del>	
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List hazardous materials used onsite.

Name of Material		No. and Size of Containers		
**	- •			

*	RCRA status:	N/A	Generator	TSD	Transporter	Permitted ISD	
							-

*	Describe treatment, storage, and disposal procedures for hazardous wastes generated onsite and identify any RCRA-regulated units.					
-						
	·					



Describe Discolored Soil.

Location	Aleai Size	Color	Otto	Source
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		Site Number:	
Stressed Vegetation: Location	Areal Size	Nature of Stress	Sourc
			<u> </u>
Odors:  Location of Occurrence	e Des	cription	Source
Transformers:			
Transformers:  Manufac	cturer		. m.,
ID Numi	<del></del>		
Presence	e of PCB labels		
Fluorescent Light Ballasts:			
Fluorescent Light Ballasts:	Presence of "No	PCB" labels	·
Fluorescent Light Ballasts:	Presence of "No		
Fluorescent Light Ballasts:  Describe onsite debris and/	Yes	No	
	Yesor trash disposal are	No	
Describe onsite debris and/	Yesor trash disposal are	No	
Describe onsite debris and/	Yesor trash disposal are	No	
Describe onsite debris and/ Area ID or Location	Yesor trash disposal are	eas: Contents	
Describe onsite debris and/	Yesor trash disposal are	eas: Contents	als:
Describe onsite debris and/ Area ID or Location	Yesor trash disposal are	eas: Contents	als:
Describe onsite debris and/ Area ID or Location	Yesor trash disposal are	eas: Contents	als:
Describe onsite debris and/ Area ID or Location	Yesor trash disposal are	eas:  Contents  Polity to onsite waste materi	als:
Describe onsite debris and/ Area ID or Location  Describe any restrictions or	Yesor trash disposal are	eas:  Contents  Polity to onsite waste materi	als:

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Site Number:
WASTE SOURCE SUMMARY
Complete this portion of the checklist only after all available current and historic waste characteristics data have been gathered through the field reconnaissance and record search. Table 1 is designed to help you delineate site sources for scoring purposes.
For each source at the site, summarize in Table 1 (page 25):
1. Source Name
2. Source Type (according to Source Type Descriptions in PA Guidance, page A-6)
3. Size/volume/area of all features/structures that might contain hazardous waste
4. Estimated waste quantity as measured onsite or from record search
5. Types of hazardous substances handled
6. Condition/integrity of each storage disposal feature or structure
7. Sources of information for current site conditions and historical site conditions
In the space below provide any additional information/clarification on waste source delineation and quantification (e.g., when waste source data is limited and the waste quantity is estimated high for conservative scoring purposes, documentation of method and rationale is required):

GROUNDWATER PATHWAY	
Groundwater at Site: (identify depth, quality, gradient,	and use)
flow is south towards the new A	uner)
In Table 2 (page 26), give names, descriptions, and char units underlying the site.	acteristics of geologic/hydrogeologic
Number of onsite drinking: and monitoring: _ sketch (page 22).	wells. Show locations on site
Obtain boring logs and well completion diagrams if avai	lable.
Source of Site Prinking Water:	
Bottled Water: Yes No	<u> </u>
Wells Onsite: Yes No	
Public Water Supply: Yes No	
Name of Agency:	Contact Person;
Other:	Phone Number:
Any positive or circumstantial evidence of a release to gr	roundwater?
Describe:	
Source of information:	
Is a release to groundwater from current or historic sout the following criteria and describe.)	rces suspected? (Base this judgment of
Are sources poorly contained?	
Is the source a type likely to contribute to groundy	water contamination (e.g., wet lagoon

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	Site Number:
Is the site locate	ed in an area of karst terrain?
Is the substrefac	e highly permeable or conductive?
Is drinking wate	er drawn from a shallow aquifer?
Are suspected co	ontaminants highly mobile in groundwater?
•	or circumstantial evidence suggest groundwater contamination?
Other criteria?	
***************************************	
ny primary groun	dwater targets exist? (Base this judgment on the following criteria an
ribe.)	
ibe.) Is any drinking	water well nearby?
ibe.) Is any drinking Has any nearby	water well nearby?  drinking water well been closed?
ribe.) Is any drinking Has any nearby Has any nearby	water well nearby?  drinking water well been closed?  drinking water user reported foul-tasting or foul-smelling water?
ibe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking	water well nearby?  drinking water well been closed?
ibe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking exposed to a haz	water well nearby?  drinking water well been closed?  drinking water user reported foul-tasting or foul-smelling water?  well have a large drawdown or high production rate?  water well located between the site and other wells that are suspected to
ibe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking exposed to a haz	water well nearby?  drinking water well been closed?  drinking water user reported foul-tasting or foul-smelling water?  well have a large drawdown or high production rate?  water well located between the site and other wells that are suspected tardous substance?
ibe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking exposed to a haz Does analytical Does any drinkin	water well nearby?  drinking water well been closed?  drinking water user reported foul-tasting or foul-smelling water?  well have a large drawdown or high production rate?  water well located between the site and other wells that are suspected to cardous substance?  or circumstantial evidence suggest contamination at a drinking water well.
ribe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking exposed to a haz Does analytical Does any drinkin	water well nearby?  drinking water well been closed?  drinking water user reported foul-tasting or foul-smelling water?  well have a large drawdown or high production rate?  water well located between the site and other wells that are suspected to cardous substance?  or circumstantial evidence suggest contamination at a drinking water well warrant sampling?
ribe.) Is any drinking Has any nearby Has any nearby Does any nearby Is any drinking exposed to a haz Does analytical Does any drinkin	water well nearby?  drinking water well been closed?  drinking water user reported foul-tasting or foul-smelling water?  well have a large drawdown or high production rate?  water well located between the site and other wells that are suspected to cardous substance?  or circumstantial evidence suggest contamination at a drinking water well warrant sampling?

•	Site Name:
•	Site Number:
	s of and the number of people served by drinking water wells that you sed to hazardous substances from the site.
Discuss groundwater us	sage within four miles of the site.
Ū	
Source of information:	
most boundary(ies) of	tion served by groundwater in the table below as measured from the outer the source(s) to drinking water supply wells. Provide apportionment (page 27) if applicable.
Distance (miles)	Population
0 - 1/4	- Committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the committee of the comm
1/4 - 1/2	
1/2 - 1	
1 - 2	
2 - 3	
3 - 4	
3 - 4 _	
Source of information:	
What is the distance to	the nearest drinking water well?
	<u> </u>
Are any wellhead prote	ection areas present within 4 miles of the site?
	-
irrigation, commercial	from wells within 4 miles of the site used for commercial food/forage crop livestock water, ingredient in commercial food preparation, supply for, or supply for a major water recreation area? Specify.
·	

Identify the surface-water bodies that	could potentially receive	runoff from the s	ite.
Closist water body is	the New Rince	to the sa	ith.
		<u> </u>	· · · · · · · · · · · · · · · · · · ·
Discuss the probable surface runoff pa	ttorns from the site to su	rfogg waters	
PRIVED FOR SERVING			Clar
Ner River		11001141	, CA 80
THE PINE			
Provide a simplified sketch of surface			
stream miles (page 23). Identify which	i water courses are over	and, intermittent,	or perent
Determine the average annual stream f	low of downstream surfa	ce water for 15 do	wnstrean
Water body:	Flow:	cfs	
Water body:	Flow:	cfs	
Water body:		cfs	
Water body:	_	cfs	
Water body:		cfs	
Source of information:			
Describe and locate on the surface wat	er features map (page 23	) the probable poi	nt of ent
(PPE) of potential hazardous substanc			<u></u>
Measure the shortest overland flow dis	tance from any source to	a perennial surfac	ce-water
(if part of the migration pathway is vi- the overland measurement; measure the	ı intermittent drainages,	include these drai	nages as
Is the site or portions thereof located i	n surface water?		
NO			
			·
What is the site flood frequency?			

Is surface water nearby?
Is waste quantity particularly large?
Is the drainage area large?
Is rainfall heavy?
Is the infiltration rate low?
Are sources poorly contained or prone to runoff or flooding?
Is a runoff route well defined (e.g., ditch or channel leading to surface water)?
Is vegetation stressed along the probable runoff route?
Are sediments or water unnaturally discolored?
Is wildlife unnaturally absent?
Has deposition of waste into surface water been observed?
Is groundwater discharge to surface water likely?
Does analytical or circumstantial evidence suggest surface-water contamination?
Other criteria?

Site Number: ___

Is any target nearby? If yes, specify below:

Fishery ____

Sensitive environment

Drinking water intake _____

Has any intake, fishery, or recreational area been closed?
Does analytical or circumstantial evidence suggest surface-water contamination at or downstream of a target?
Does any target warrant sampling? If yes, specify below:
Drinking water intake
Drinking water intake  Fishery
Sensitive environment
Other criteria?
Primary intake(s) identified?
Other criteria?  Primary intake(s) identified?  Primary fisher(ies) identified?  Primary sensitive environment(s) identified?
Primary sensitive environment(s) identified?
Source of information:
Are any intakes part of a Blended water supply system, and if so, how many other intakes or wells supply the same system?
What is the distance to the nearest drinking water intake?
Describe and locate fisheries within 15 downstream miles of the site.
Source of information:

	Site Name:
	Site Number:
Describe any sensitive environments (PA stream miles of the site.	Guidance, PA Table 5, page A-31) within 15 down-
Measure the total length (or frontage) of stream mile target distance limit of the s	wetlands adjacent to surface water along the 15 down- ite.

Desci	ibe known surficial (within 2 feet of surface) areas of contamination on or adjacen
	me known
·	
<del>,</del>	
*	Visual evidence of run-on/runoff? Yes No  Visual signs of contaminated run-on/ Yes No
*	Visual signs of contaminated run-on/ Yes No runoff?
Desci	iption and direction of site runoff:
	south to New River
	nce-water run-on from neighbor's property (identify source directions and contamin
poter Dete	
poter Dete	mine if a resident population for the soil exposure pathway can be identified on the
poter Dete	mine if a resident population for the soil exposure pathway can be identified on the ollowing criteria. Describe.  Is any residence, school, or daycare facility on or within 200 feet of an area of sus
poter Dete	mine if a resident population for the soil exposure pathway can be identified on the ollowing criteria. Describe.  Is any residence, school, or daycare facility on or within 200 feet of an area of suscentamination?  Is any residence, school, or daycare facility located on adjacent land previously own
poter Dete	mine if a resident population for the soil exposure pathway can be identified on the ollowing criteria. Describe.  Is any residence, school, or daycare facility on or within 200 feet of an area of sus contamination?  Is any residence, school, or daycare facility located on adjacent land previously owleased by the site owner/operator?  Is there a migration route that might spread hazardous substances near residences,
poter Dete	mine if a resident population for the soil exposure pathway can be identified on the ollowing criteria. Describe.  Is any residence, school, or daycare facility on or within 200 feet of an area of sus contamination?  Is any residence, school, or daycare facility located on adjacent land previously own leased by the site owner/operator?  Is there a migration route that might spread hazardous substances near residences, or daycare facilities?  Have onsite or adjacent residents or students reported adverse health effects, exclusions.
poter Dete	mine if a resident population for the soil exposure pathway can be identified on the ollowing criteria. Describe.  Is any residence, school, or daycare facility on or within 200 feet of an area of suscontamination?  Is any residence, school, or daycare facility located on adjacent land previously owleased by the site owner/operator?  Is there a migration route that might spread hazardous substances near residences, or daycare facilities?  Have onsite or adjacent residents or students reported adverse health effects, excluapparent drinking water or air contamination problems?

· · · · · · · · · · · · · · · · · · ·	Site Number:  sidences or attending school or da	
number of people occupying reas of suspected contamination.	sidences or attending school or da	
as of suspected contamination.		lyegra on or with
ny workers?		
kers are employed at offsite fa	-	
errestrial sensitive environment entamination.	S (PA Guidance, PA Table 7, page	e A-39) on an ar
estock grazing present on areas	s of suspected contamination? Spe	ecify.
a	active?	active?

Site Name:		
Site Number:	•	
Dite Muniber.		 

## AIR PATHWAY

Describe current or historic sources for which migration of hazardous substances to the air pathway could occur.

none known

Is a release of hazardous substances to the air pathway suspected? (Base judgment on the following criteria and describe.)

Are odors currently reported or have they been reported in the past?

Has release of a hazardous substance to the air been directly observed?

Are there reports of adverse health effects (e.g., headaches, nausea, dizziness) potentially resulting from migration of hazardous substances through the air?

Does analytical or circumstantial evidence suggest a release to the air?

Other criteria?

Suspected release?

Summarize the population within a four-mile radius of the site.

Distance (miles) Population

* Onsite

* 0 - 1/4

1/4 - 1/2

1/2 - 1

1 - 2

2 - 3

3 - 4

	Site Number:
_	
Determine the distance from the	outer boundary of the sources available to the air pathway to
the nearest individual. (Nearest	individual can be a worker, resident, or student. Measure from
the outer boundary of air sources	s to the building occupied by the nearest individual.)
T-1426	(DAC Stance DA Welle & week A 21) within 0
identity and locate any sensitive	environments (PA Guidance, PA Table 5, page A-31) within 0
to $1/4$ mile and $1/4$ to $1/2$ mile $6$	of the site.
and the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second o	

	Site Number:					
General Comments						
Describe any additional information collected and clarify any issues previously addressed. Use his space to document any assumptions made for scoring purposes, and the rationale behind hose assumptions.						
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INTERVIEWS					
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Site Name:	
Site Number:	

# Sketch of Site

Include all pertinent features (e.g., wells, storage areas, underground storage tanks, waste areas, buildings, access roads, areas of ponded water, etc.). Attach additional sheets with sketches of enlarged areas, if necessary.

N †

Site Name:	
Site Number:	

# Surface-Water Features

Provide a simplified sketch of surface runoff and surface-water flow system for 15 downstream miles. Include all pertinent features (e.g., drinking water intakes, sensitive environments, fisheries, gauging stations, PPE, etc.).

		N †

Site Name: _	
Site Number:	

# Photo Log

Photo Number	Description of Location	Looking Which Direction	Comments	
572 1 - BUT	wash-mile	west.	Estruture ses li	exy
573	1 650 COL	AND AND WINDS	just beyond i	

Table 1: Source Summary¹

Source	Source Type	Size	Estimated			Sources of I	nformation
Source Name	Source Type (PA Guidance, page A-6)	(volume/area)	Estimated Waste Quantity	Specific Compounds	Containment ²	Current	Historical
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¹ Use additional sheets if necessary.
² Evaluate containment of each source from the perspective of each migration pathway (e.g., groundwater pathway - nonexistent, natural, or synthetic liner, corroding underground storage tank; surface water - inadequate freeboard, corroding bulk tanks; air - unstabilized slag piles, leaking drums, etc.).

Table 2: Hydrogeologic Information¹

Strata Name/Description	Thickness (feet)	Hydraulic Conductivity (cm/sec)	Type of Discontinuity ²	Source of Information
-				

¹ Use additional sheets if necessary.
2 Identify the type of discontinuity within four miles from the site (e.g., river, strata "pinches out", etc.).

Table 3: Apportionment Calculations for Drinking Water Wells¹

	<u>,</u>	····		,			
Distance Category (miles) 0 - 1/4	Well Number	Well Name	System	Population Served by System	Total Wells Supplying System	Population Served by Well	Total Population Served for Distance Category
·							
1/4 - 1/2							
1/2 - 1							
1 - 2							
2 - 3							
3 - 4					·		

¹ See PA Guidance, pages 63 and 64 for additional guidance on apportionment.

APPENDIX J TECHNICAL MEMORANDUM - SUMMARY OF GROUNDWATER DATA AND AQUIFER CHARACTERISTICS

# SUMMARY OF GROUNDWATER DATA AND AQUIFER CHARACTERISTICS MARINE CORPS BASE, CAMP LEJEUNE JACKSONVILLE, NORTH CAROLINA

## **SUMMARY**

This study examines the utility of exploratory aquifer tests (pump tests) at investigation sites across Marine Corps Base, Camp Lejeune (MCB-CL). The study reviews the available information on the relevant water-bearing layers, considers the general characteristics and applicability of aquifer tests, and concludes:

- That available information is satisfactorily complete to allow appropriate designs of groundwater systems in the main operating areas of MCB-CL;
- That quantified characterization of the water-bearing layers in explored areas of MCB-CL can be extended to other areas having similar geologic terrane;
- That exploratory tests are no longer routinely required or advisable;
- That reconnaissance testing (well-head tests or slug tests) of each newly installed or otherwise uncharacterized data station is highly advisable; and,
- That performance testing of groundwater extraction systems should be the recommended form of evaluating and adjusting withdrawal systems.

### BACKGROUND

This study considers the aquifer characteristics (especially, the Coefficient of Transmissivity) and the production capacities (available discharge rates) of the two water-bearing layers relevant to the studies at MCB-CL. These water-bearing layers are the (shallow or surficial) water table and the Upper Castle Hayne Aquifer.

The water table at MCB-CL occupies the water-bearing zone within 25 to 35 feet of the surface; the Castle Hayne, immediately below this. However, the separation of the water table and the Castle Hayne is not always obvious. Usually, this separation is effected only by the low permeability material of the water table transiting to the significantly more permeable material of the Upper Castle Hayne; there is rarely an aquiclude or aquitard of vertically extensive clay separating the water table from the Castle Hayne.

The data available for this summary derive from three main sources:

- Assessment of Hydrologic and Hydrogeologic Data at Camp Lejeune Marine Corps Base, North Carolina; U.S. Geological Survey, Water-Resources Investigation Report 89-4096; 1989
- Wellhead Management Program Engineering Study 91-36; Geophex, Ltd.; 22Jan91
- Various site investigations by Baker Environmental, Inc., and reported to LANTDIV and MCB-CL

#### DISTRIBUTION OF DATA

The data available from the various sources have been compiled on Tables 1, 2 and 3, with Table 3 summarizing the relevant flow information. The accompanying map indicates the distribution of stations from which data are available.

The tabulated data indicate the main characteristics of each water-bearing layer:

- There is low available production from the water table.
- There is an excessive availability of production from the Castle Hayne compared to the probably acceptable levels of treatment volumes foreseeable in groundwater remediation systems.

The water table had production capacities of less than 5 gallons per minute (gpm) in all cases tested. The specific capacities of the discharge wells were always less than 1 gallon per minute per foot of drawdown (gpm/ft). The transmissivities calculated were generally near or below 1000 gallons per day per foot of drawdown (gpd/ft); only the deeper wells, which intercepted at least part of the Castle Hayne, had transmissivities in a range indicative of an acceptably producing zone. The hydraulic conductivity values were commonly in the range of tenths of feet per day (ft/d). The low production rates, low transmissivities and low hydraulic conductivities indicate that the water table is only marginally, at best, under Darcian conditions. Calculations based on these data would, therefore, be highly unreliable. However, the available information all indicate an expectably low rate of groundwater discharge, which in turn would produce only a narrow radius of effect around an individual production well:

The standard equation for calculation of the radius of capture around an individual well is  $r_c$ =720Q/ $\pi$ Ti. With a discharge rate (Q) of 3 gpm, a transmissivity (T) of 500 gpd/ft and a representative gradient of 0.005, the radius of capture would be 275 ft. However, this calculation applies only to Darcian conditions in a homogeneous medium; the water table at MCB-CL is marginally Darcian and is highly non-homogeneous. The calculation of radius must, therefore, be in some degree of error, with no more usable data or calculation possible.

The Castle Hayne has production capacities generally ranging above 200 gpm. The estimated transmissivities are at least in the range of several tens of thousands gpd/ft, with specific capacities usually about 5 to 10 gpm/ft. The calculated hydraulic conductivities are usually in the scores of feet per day. The available discharge from the Castle Hayne is, therefore, much greater than that from the water table. The limiting factor in remediation schemes for the Castle Hayne then becomes the amount of water that can be treated by an affordable system, usually less than 500 gpm; this value of 500 gpm would be available from one or two wells in the Castle Hayne. The high values of aquifer parameters, the relatively low total discharge and the low number of production wells would conspire to limit the radius of effect available to a remediation scheme:

The standard equation for calculation of the radius of capture around an individual well is  $r_e=720Q/\pi Ti$ . With a Q of 500 gpm, a T of 50000 gpd/ft and a representative gradient of 0.005, the radius of capture would be only 460 ft.

## COMPARABILITY OF DATA ACROSS MCB-CL

The stratigraphic sequences of MCB-CL containing the water table and the Upper Castle Hayne have been well characterized. The available information indicates that the lithology and the hydrologic conditions can be correlated stratigraphically across the base (Tables 1 and 2). From these correlations, aquifer performance can be predicted sufficiently for an engineering design whose final criteria for suitability are performance-based.

The upper water-bearing zone is a highly variable layering and intercalation of clay, silt and sand. This variability, however, is found within recognizable limits. These limits correspond to the range of hydrologic characteristics described previously. Similar correlation is available for the lithology and hydrology of the Upper Castle Hayne.

In areas not near stations catalogued in Tables 1, 2 and 3, a reconnaissance comparison of well-head tests (slug tests) and an examination of lithologic descriptions will likely be sufficient to support the engineering evaluation of the site. There is ample demonstration that lithology has a significant influence on the hydrology of a site, and that, for a given geologic terrane, the influence is fairly consistent. The geologic terrane of MCB-CL has been broadly characterized and correlated between lithologic (stratigraphic descriptions) and hydrologic (aquifer tests and well-head tests) sequences. Lithologic descriptions can now provide a good indication of hydrologic conditions at MCB-CL in areas of similar terrane.

## GENERAL APPLICABILITY OF AQUIFER TESTS

Aquifer (pump) tests are an extremely dangerous activity at contamination sites. While the information available from aquifer tests is required for engineering design of withdrawal systems, aquifer tests should not be a reconnaissance or an initial step in the investigation. Full consideration must be made of the redistribution of contaminants expectable from the test, of the change in structural support of disposal features by relaxation or increase of hydrostatic loading, and so forth.

Consideration must also be made of alternative sources of acceptable data on the aquifer. In the case of MCB-CL, alternatives to exploratory aquifer tests are available from the tabulation and correlation of aquifer characteristics, production performance and geologic terrane presently available.

From the available information and in light of the relative consistency of the geologic terrane of MCB-CL, exploratory tests at MCB-CL are not generally required. Therefore, exploratory tests are not advisable and should not form part of the initial investigation of a site. While they may be useful in certain circumstances after the initial investigation of a site, they should not, in the general case, be part of the investigation. Sufficiently satisfactory information is presently available to allow the initial engineering design of a groundwater response.

While exploratory aquifer tests are not advisable, performance tests of a newly installed system are highly recommended. These tests, to some extent, are a normal part of the initial operation of a system. Only minor additional monitoring and modification of the system during operation would provide data directly relevant to the long-term operation of that system.

In the Coastal Plain of MCB-CL, the information from an exploratory data station not coincident with the long-term extraction system is not fully transferable. That is, if the test station and the

recovery station are not the same, the aquifer parameters and calculations based on those parameters will differ. This means that data from an exploratory station are no more reliably usable that the data presently available, unless the exploratory station is collocated with the recovery system. However, if the exploratory and recovery stations are identical, and considering that alternative sources of acceptable data on the aquifer are available and that a performance test must be run as part of the initial operation of a recovery system, the exploratory test represents a superfluous duplication of effort.

TABLE 1
CAMP LEJEUNE PUMP TEST DATA

			Total	<del></del>		Water-level	Pumping Rate		Specific	<del> </del>	<del></del>		
	Well	Well	Aquifer	Screened	Screened	Drawdown	(Recovery	Duration	Capacity	т	ĸ	s	
	Depth	Diameter	Thickness	Length	Interval	During Pumping	wells)	of Pumping	(pumping rate/	(square ft/	(ft/day)		Soils
Well Number	(ft,BGS)	(in)	(ft)	(ft)	(ft,BGS)	(ft,BGS)	GPM	(min)	drawdown)	day)			(ft,BGS)
013RW-01*	23	2	15	- 20	3-23	8.773	1	480	0.11	7.17	0.48	NA	0-10 silu/clay, 10-23 sand.
013MW-18	13	2	15	10	3-13	0.297	NA	480	NA	105.98	7.06	1.40E-02	0-7 silt/clay, 7-13 sand.
013MW-21	14	2	, 15	10	4-14	0.31	NA	480	NA	82.27	5.48	2.77E-02	0-4 silt/sand, 0-14 clay/silt
108RW-01*	15	2	9	9.1	2.45-11.55	6.38	0.5	485	0.08	5.30	0.59	NA	very fine sand
108MW-04		2	9	<u> </u>			NA	485	NA	118.63	13.18	1.33E-02	
108MW-15	12.5	2	9	9,03	2.79-11.82		NA	485	NA	56.78	6.31	7.33E-03	0-8 sand/silt, 8-10 silt/clay
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109MW-15	<b></b>	2	15			0.939	NA NA	460	NA	76.26	5.08	1.11E-02	
109MW-17	14.5	2	15	10	4.5-14.5	0.545	NA NA	460	NA.	163.10	10.87	7.30E-03	0-15 fine sand
109RW-01*	15	2	15	9,5	2-11.5	6.265	3	460	0.48	7.80	0.52	NA	0-4 sand, 4-8 silt, 8-15 sand
	,	,					<del> </del>	<del>,</del>			<del>,</del> .		
ORW-01* (Drawdown, Theis)	21.8	2	50	19.2	2-21.2	9.53	3	475	0.31	200.02	4.00	NA .	0-10.5 sand/silt, 10.5-15 sand/clay, 15-21.5 sand/clay, 21.5- sand
ORW-01° (Drawdown,Cooper)	ļ					<u> </u>				161.86	3.24	NA NA	
ORW-01* Recovery(Theis)										106.06	2.12	NA_	
0DW-01 (Drawdown,Theis)	30.3	2	50	4.8	24.9-29.7	0.02	3	475	NA NA	7080.48	142.00	4.52E-03	0-4 sand/silt, 4-10.5 clay, 10.5-15.5 sand/silt, 15.5-20.5 clay, 20.5-on sand
10DW-01 (Drawdown,Cooper)				<u></u>					NA NA	7099.20	142	4.51E-03	
10DW-02 (Drawdown, Theis)	30	2	50	4.7	24.7-29.4	0.52	NA NA	475	NA NA	5398.56	108.00	1.51E-03	0-3 sand and silt with clay layers, 3-11 sand and silt, 11-30 sand with some limited clay layers
10DW-02 (Drawdown, Cooper)						<u> </u>		<u> </u>	NA NA	5400.00	108	1,51E-03	<u></u>
10DW-03 (Drawdown, Theis)	30	2	50	4.9	24.5-29.4	0.47	NA	475	NA_	2952.00	59,00	7.48E-02	0-6 sand and slit , 6-12 sand , 12-23 sand/clay , 23-30 sand
10DW-03 (Drawdown, Cooper)	<u></u>								NA NA	3225.60	64	5.85E-02	

Transmissivity

⁼ Hydraulic Conductivity

[:] Storativity

[•] Pumping well

⁻ Not applicable

TABLE 2
HYDRAULIC CONDUCTIVITY TEST RESULTS (SLUG TEST)

			Saturated				
il l	Well	Well	Aquifer	Screened	Screened	K	
Well	Depth	Diameter	Thickness*	Length	Interval	Rising	Soils
Number	(ft,BGS)	(in)	(ft)	(ft)	(ft,BGS)	(ft/day)	(ft,BGS)
013MW-03	14	2	1	9.8	4-13.8	0.75	0-6 clay, 6-14 silt
013MW-04	14	2	8.13	9.8	4-13.8	0.27	0-8 clay, 8-14 silt
013MW-11	16	2	9.14	10	6-16	0.37	0-4 sand/silt, 4-14 clay, 14-16 sand
013MW-21	14	2	9.2	10	4-14	0.46	0-4 silt/sand, 4-14 clay
108MW-08	12.8	2	8.83	9.7	2.7-12.4	0.59	0-8 very fine sand, 8-12 clayey peat, 12-13 sandy clay
108MW-09	12.8	2	7.81	9.7	2.8-12.5	0.53	0-13 silt/sand
108MW-13	10.8	2	NA	9.02	0.69-9.71	0.061	0-2 very fine sand, 8-9.5 sandy clay
108MW-17	13.1	2	NA	9.03	3.39-12.42	0.59	0-8 fine grained sand, 8-9 clayey peat, 9-12.5 sandy clay
109MW-17	14.5	2	9.04	10	4.5-14.5	9.00	0-15 fine sand
109MW-18	14	2	10.19	10	4.5-14.5	5.70	0-3 sand, 3-10 silt, 10-14 sand
110MW-07	11.96	2	9	9.8	1.5-11.3	0.0115	0-2 clay/silt, 2-4 clay/sand, 4-6 sand, 6-10 silt/clay, 10-14 silt /sand
110MW-09	14.2	2	9.47	9.8	3.8-13.6	0.16	0-6 sand/silt, 6-9 clay/silt, 9-12 sand/silt, 12-14 clay
110DW-03	30	6	22.04	4.9	24.5-29.4	1.07	0-3 sand, 3-4 clay, 4-10 sand/silt, 10-12 sand, 12-13 clay, 13-22 silt/clay, 22-30 sand
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41GW-07	20.5	2	12.03	10	10.5-20.5	1.15	1-5 silty sand, 5-9 clay, 9-10 silty sand, 10-12 fill, 12-16 silty sand with 1 ft clay layer, 16-21 sand
41GW-08	15	2	9.48	10	5-15	0.14	0-1 silty sand, 1-6 sand, 6-14 clay with sand and silt, 14-16 silty sand
41GW-09	21	2	11.89	10	11-21	3.67	0-5 clay and sand, 5-21 silty sand
41GW-10	13	2	8.59	10	3-13	0.94	0-2 silty sand, 2-7 sand, 7-9 silty sand and clay, 9-12 lithified sandstone, 12-13 sand. 13-14 lithified sandstone
41GW-12	16	2	12.45	10	6-16	4.57	0-4 silty sand, 4-14 sand, 14-17 lithified sandstone
ļ,					,		
69GW-09	20.5	2	14.22	10	10.5-20.5	1.7	1-4 Sand/silt, 4-10 clay some sand, 10-21 sand/silt
69GW-10	16	2	10.5	10	6-16	0.17	1-17 sand/silt
69GW-12	12.5	2	11.27	10.5	2-12.5	0.12	0-13.5 sand/silt
69GW-02D	125	2	22.1	10	40-50	0.29	0-125 silty sand **
69GW-12D	58	2	53.83	10	48-58	6.66	0-58 silty sand **
74GW-03A	18	2	13.58	10	8-18	0.59	0-17 silty sand, 17-18.5 sandy clay
74GW-06	16.5	2	8.18	9.74	15.5-26	6.33	1-26 sand/silt
74GW-08	23	2	10.51	10	13-23	3.55	0-1 silty sand, 1-24 sand

^{*} Values taken from AQTESOL results. (Bottom of screened interval- water level)

^{**} Due to depth, soils were very generally described.

K = Hydraulic Conductivity

TABLE 3
BARONE: 8SEP94: CL5-1A1: 1/5

3-CL5	CTO-232	CL5-1B1.wks		8SEP94	MCB-CAMP I	LEJEUNE
STATION	b ft	Q gpm	Sc gpm/ft	T ft-sq/d	T gpd/ft	K ft/d
013RW-01 013MW-1 013MW-2 013MW-03 013MW-04 013MW-11 013MW-21 41GW-07 41GW-08 41GW-09 41GW-10 41GW-12 69GW-10 69GW-12 69GW-12 69GW-12 69GW-12DW 74GW-03A	15 15 15 1 8 9 8	1.0	0.11	7.2 106.0 82.3	54 793 615	0.5 7.1 5.5 0.8 0.3 0.4 0.5 1.2 0.1 3.7 0.9 4.6 1.7 0.2 0.1 0.3 6.7
74GW-06 74GW-08 108RW-01 3MW-0 108MW-1 108MW-08 108MW-09 108MW-13 108MW-17	9 9 9 8 8 8	0.5	0.08	5.3 118.6 56.8	40 887 425	6.3 3.6 0.6 13.2 6.3 0.6 0.5 0.1
109MW-1 109MW-1 109RW-01 109MW-17 109MW-18	15 15 15 15 15	3.0	0.48	76.3 163.1 7.8	570 1220 58	5.1 10.9 0.5 9.0 5.7
110RW-01 110RW-01 110RW-01 110DW-01 110DW-02 110DW-02 110DW-03 110DW-03 110DW-03 110MW-07 110MW-09	50 50 50 50 50 50 50 50 9 9	3.0 3.0 3.0	0.31 0.31	200.0 161.9 106.1 7080 7099 5399 5400 2952 3226	1496 1211 793 52962 53102 40381 40392 22081 24127	4.0 3.2 2.1 142.0 108.0 108.0 59.0 64.0 0.1 0.2 5.8

BARONE:8SEP94:CL5-1A1:1/5

STATION	b ft	Q gpm	Sc gpm/ft	T ft-sq/d	T gpd/ft	K ft/d
DD 43	0.75			-		·
BB-43	275	170	5.0	8900	66572	32.4
BB-44	275	450	10.0	17900	133892	65.1
BB-222	275	329	9.4	10600	79288	38.5
HP-612	285	275	5.4	7900	59092	27.7
HP-614	285	323	4.9	6600	49368	23.2
HP-621	300	200	9.1	24500	183260	81.7
HP-628	320	160	3.4	6400	47872	20.0
HP-629	300	210	5 <b>.7</b>	7900	59092	26.3
HP-634	300	163	4.5	4300	32164	14.3
HP-636	300	211	6.8	6900	51612	23.0
HP-643	295	278	5.3	9700	72556	32.9
HP-644	300	246	4.3	8100	60588	27.0
HP-646	305	304	10.6	20200	151096	66.2
HP-647	305	500	9.8	18700	139876	61.3
HP-648	310	250	2.9	5600	41888	18.1
HP-649	310	257	2.6	5000	37400	16.1
HP-651	305	270	3.8	7300	54604	23.9
HP-652	320	218	2.2	4400	32912	13.8
HP-663	325	350	4.8	6400	47872	19.7
HP-699	275	250	5.7	7700	57596	28.0
HP-700	270	250	6.8	11500	86020	42.6
HP-701	275	250	7.2	12400	92752	45.1
HP-705	295	250	9.0	13100	97988	44.4
HP-706	300	250	3.8	4700	35156	15.7
HP-709	310	200	4.4	8500	63580	27.4
HP-710	310	200	5.1	9900	74052	31.9
HP-711	320	200	6.8	10700	80036	33.4
LCH-4006	295	540	10.0	14500	108460	49.2
LCH-4007	295	275	11.8	13700	102476	46.4
M-267	260	170	7.7	10300	77044	39.6
M-628	260	70	3.0	6100	45628	23.5
RR-229	290	429	12.2	19400	145112	66.9
TT-25	280	150	5.0	7200	53856	25.7

STATION	PUMPING LEVEL	gpm Q	Sc gpm/ft
HP-602 HP-603	44 30	154 129	3.5 4.3
HP-606	38	267	7.0
HP-607	46	246	5.3
HP-608	21	208	9.9
HP-609	45	199	4.4
HP-610	14	214	15.3
HP-613	17	157	9.2
HP-616	15	178	11.9 24.9
HP-620 HP-622	9 55	224 330	6.0
HP-623	30	210	7.0
HP-628	45	172	3.8
HP-629	45	216	4.8
HP-632	21	224	10.7
HP-633	18	205	11.4
HP-634	. 36	219	6.1
HP-635	33	151	4.6
HP-636	35	149	4.3
HP-637	40	130	3.3
HP-638 HP-639	84 52	201 []	2.4
HP-640	28	210	0.0 7.5
7-641	44	351	8.0
-642	32	[]	0.0
HP-643	35	269	7.7
HP-644	52	230	4.4
HP-645	40	192	4.8
HP-646	1.1	154	14.0
HP-647	26	302	11.6
HP-648	84	263	3.1
HP-649	80	100	1.3
HP-650 HP-651	75 60	480	6.4
HP-652	69 82	242 216	3.5 2.6
HP-653	29	197	6.8
HP-654	30	175	5.8
HP-655		[]	ERR
HP-660		150	ERR
HP-661	37	275	7.4
HP-662	53	148	2.8
HP-663	23	100	4.3
HP-698	33	216	6.5
HP-699	21	140	6.7

STATION	PUMPING LEVEL	gpm Q	Sc gpm/ft
HP-700	39	192	4.9
HP-701	36	236	6.6
HP-703	33	293	8.9
HP-704	38	159	4.2
HP-705	25	214	8.6
HP-706	33	214	6.5
HP-707	51	50	1.0
HP-708	42	219	5.2
HP-709	52	239	4.6
HP-710	29	115 235	4.0 4.2
HP-711 HP-5186	56 38	336	8.8
LCH-4007	34	150	4.4
LCH-4007	22	349	15.9
TT-23	36	160	4.4
TT-25	22	130	5.9
TT-26	32	127	4.0
TT-31	28	111	4.0
TT-52	18	236	13.1
TT-54	20	119	6.0
TT-67	29	119	4.1
RR-45	11	192	17.5
RR-47	5	140	28.0
RR-97	14	170	12.1
RR-229	35	[]	0.0
BB-44	11	125	11.4
BB-47	6	341	56.8
BB-218	17	192	11.3
BB-220	13	119	9.2
BB-221	19	230	12.1
TC-325	8	100	12.5
TC-502	1	180	180.0
TC-504	35	203	5.8
TC-600	32	172	5.4
TC-604	16	137	8.6
TC-700	28	125	4.5
TC-901	37	[]	0.0
TC-1000	25	110	4.4
TC-1001	16	160	10.0
TC-1251	6	150	25.0
TC-1253 TC-1254	5 . 3	128	25.6 40.7
TC-1254 TC-1255		122	2.9
TC-1256	36	104	2.9
10-1256	48	108	2.3

STATION	PUMPING LEVEL	Q gpm	Sc gpm/ft
AS-108	8	226	28.3
AS-131	11	310	28.2
AS-190	60	220	3.7
AS-191	16	220	13.8
AS-203	19	220	11.6
AS-4140	6	110	18.3
AS-4150	10	128	12.8
AS-5001	27	185	6.9
AS-5009	53	111	2.1
BA-164	21	214	10.2
BA-190	17	303	17.8

APPENDIX K
PA SITES FIELD INVESTIGATION ANALYTICAL DATA BUILDINGS 1120, 1409, 1512, SAS113, AS116, AS119, M119,
AND M315

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION

## PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR78-1120-IS01-01	IR78-1120-IS01-05	IR78-1120-IS02-01	IR78-1120-IS02-04	IR78-1120-IS03-01	IR78-1120-IS03-05	IR78-1409-IS01-01
SAMPLE DATE	06-28-2002	06-28-2002	06-28-2002	06-28-2002	06-28-2002	06-28-2002	06-28-2002
SAMPLE DEPTH (feet)	1-2	10.5	1-3	7.5	1-2	10	1.5
VOLATILES (ug/kg)							
1,1,1-Trichloroethane	5.4 U			5.7 U	6 U	5.5 U	5.8 U
1,1,2,2-Tetrachloroethane	5.4 U			5.7 U		5.5 U	5.8 U
1,1,2-Trichloroethane	5.4 U	6.4 1		5.7 U	6 U	5.5 U	5.8 U
1,1-Dichloroethane	5.4 U	6.4 U	U 5.9 U	5.7 U	6 U	5.5 U	5.8 U
1,1-Dichloroethene	5.4 U	6.4 1	U 5.9 U	5.7 U	6 U	5.5 U	5.8 U
1,2-Dichloroethane	5.4 U			5.7 U	6 U	5.5 U	5.8 U
1,2-Dichloropropane	5.4 U	6.4 U		5.7 U	6 U	5.5 U	5.8 U
2-Butanone (MEK)	27 U			29 U	30 U	27 U	29 U
2-Hexanone	27 U			29 U	30 U	27 U	29 U
4-Methyl-2-pentanone (MIBK)	27 U	32 1	U 29 U	29 U	30 U	27 U	29 U
Acetone	54 UJ	64 U	IJ 59 UJ	57 UJ	60 UJ	55 UJ	58 UJ
Benzene	5.4 U	6.4 U		5.7 U	6 U	5.5 U	5.8 U
Bromodichloromethane	5.4 U	6.4 1	U 5.9 U	5.7 U	6 U	5.5 U	5.8 U
Bromoform	5.4 U	6.4 U	U 5.9 UJ	5.7 U	6 U	5.5 U	5.8 U
Bromomethane (Methyl bromide)	11 U	J 13 U	U 12 U	11 U	12 U	11 U	12 U
Carbon disulfide	5.4 U	6.4 1	U 5.9 U	5.7 U	6 U	5.5 U	5.8 U
Carbon tetrachloride	5.4 U	6.4 U	U 5.9 U	5.7 U	6 U	5.5 U	5.8 U
Chlorobenzene	5.4 U	6.4	U 5.9 UJ	5.7 U	6 U	5.5 U	5.8 U
Chloroethane	11 U	13 1	U 12 U	11 U	12 U	11 U	12 U
Chloroform	5.4 U	6.4 U	U 5.9 U	5.7 U	6 U	5.5 U	5.8 U
Chloromethane	11 U	J 13 U	U 12 U	11 U	12 U	11 U	12 U
Cis/Trans-1,2-Dichloroethene	5.4 U	6.4 1	U 5.9 UJ	5.7 U	6 U	2 J	5.8 U
Dibromochloromethane	5.4 U	6.4 U	U 5.9 U	5.7 U	6 U	5.5 U	5.8 U
Ethylbenzene	5.4 U	6.4	U 5.9 UJ	5.7 U	6 U	5.5 U	5.8 U
Methylene chloride (Dichloromethane)	5.4 U	J 6.4 I	U 5.9 U	5.7 U	6 U	5.5 U	5.8 U
Styrene	5.4 U	6.4 1	U 5.9 UJ	5.7 U	6 U	5.5 U	5.8 U
Tetrachloroethene	5.4 U	J 6.4 I	U 54 J	5.7 U	6 U	5.8	5.8 U
Toluene	5.4 U	J 6.4 I	U 5.9 U	5.7 U	6 U	30	5.8 U
Trichloroethene	5.4 U	6.4 1	U 5.9 U	5.7 U	6 U	5.3 J	5.8 U
Vinyl chloride	11 U	J 13 U	U 12 U	11 U	12 U	11 U	12 U
Xylenes, Total	11 U	J 13 U	U 12 UJ	11 U	12 U	5.7 J	12 U
cis-1,3-Dichloropropene	5.4 U	6.4 U	U 5.9 U	5.7 U	6 U	5.5 U	5.8 U
trans-1,3-Dichloropropene	5.4 U	6.4 1	U 5.9 U	5.7 U	6 U	5.5 U	5.8 U

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION

## PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID SAMPLE DATE	IR78-1120-IS01-01 06-28-2002	IR78-1120-IS01-05 06-28-2002		IR78-1120-IS02-01 06-28-2002		IR78-1120-IS02-04 06-28-2002		IR78-1120-IS03-01 06-28-2002		IR78-1120-IS03-05 06-28-2002		IR78-1409-IS01-01 06-28-2002	
SAMPLE DEPTH (feet)	1-2	10.5		1-3		7.5		1-2		10		1.5	
SEMIVOLATILES (ug/kg)													
1,2,4-Trichlorobenzene	350	U 370	U	390	U	350	U	360	U	380	U	370	U
1,2-Dichlorobenzene	350			390			U		U			370	
1,3-Dichlorobenzene	350	U 370	U	390		350	U	360		380		370	
1,4-Dichlorobenzene	350	U 370	U	390	U	350	U	360	U	380		370	
2,2'-Oxybis(1-Chloropropane) (bis-2-chloroisopropyl ether)	350			390		350		360		380		370	-
2,4,5-Trichlorophenol	350	U 370	U	390		350		360	U	380		370	
2,4,6-Trichlorophenol	350	U 370	U	390	U	350	U	360	U	380	U	370	U
2,4-Dichlorophenol	350	U 370	U	390	U	350	U	360	U	380	U	370	U
2,4-Dimethylphenol	350	U 370	U	390	U	350	U	360	U	380	U	370	U
2,4-Dinitrophenol	1800	U 1900	U	2000	U	1800	U	1900	U	1900	U	1900	U
2,4-Dinitrotoluene	350	U 370	U	390	U	350	U	360	U	380	U	370	U
2,6-Dinitrotoluene	350	U 370	U	390	U	350	U	360	U	380	U	370	U
2-Chloronaphthalene	350	U 370	U	390	U	350	U	360	U	380	U	370	U
2-Chlorophenol	350	U 370	U	390	U	350	U	360	U	380	U	370	U
2-Methylnaphthalene	350	U 370	U	390	U	350	U	360	U	380	U	370	U
2-Methylphenol (o-Cresol)	350	U 370	U	390	U	350	U	360	U	380		370	U
2-Nitroaniline	1800			2000			U		U	1900		1900	
2-Nitrophenol	350	U 370	U	390	U	350	U	360	U	380	U	370	U
3,3'-Dichlorobenzidine	700	U 730	U	780	U	690	U	720	U	750	U	730	U
3-Methylphenol/4-Methylphenol (m&p-Cresol)	350	U 370	U	390	U	350	U		U	380	U	370	U
3-Nitroaniline	1800	U 1900	U	2000	U	1800	U	1900	U	1900	U	1900	U
4,6-Dinitro-2-methylphenol	1800	U 1900	U	2000	U	1800	U	1900	U	1900	U	1900	U
4-Bromophenylphenyl ether	350			390			U		U	380		370	
4-Chloro-3-methylphenol	350	U 370	U	390	U	350	U	360	U	380	U	370	U
4-Chloroaniline		U 730		780			U		U	750		730	
4-Chlorophenylphenyl ether		U 370		390			Ū		Ü	380		370	
4-Nitroaniline	1800			2000		1800		1900		1900		1900	
4-Nitrophenol	1800			2000		1800			Ü	1900		1900	
Acenaphthene	350			390			Ü		Ü	380		370	
Acenaphthylene	350			390		350			Ü	380		370	
Anthracene	350			390			U		Ü	380		370	
Benzo(a)anthracene	350			390		350			Ü	380		370	
Benzo(a)pyrene	350			390		350		360		380		370	
Benzo(b)fluoranthene	350			390		350		360		380		370	
Benzo(g,h,i)perylene	350			390		350		360		380		370	
Benzo(g,n,r)peryrene	330	570	C	370	C	330	C	300	O	300	C	370	0

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION

## PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR78-1120-IS01-01	IR78-1120		IR78-1120-IS02-01		IR78-1120-IS02-04		IR78-1120-IS03-01	]	IR78-1120-IS03-05		IR78-1409-IS01-01	ľ
SAMPLE DATE	06-28-2002	06-	-28-2002	06-28-2002		06-28-2002		06-28-2002		06-28-2002		06-28-2002	ŗ
SAMPLE DEPTH (feet)	1-2		10.5	1-3		7.5		1-2		10		1.5	ŗ
SEMIVOLATILES (ug/kg) cont'd													,
Benzo(k)fluoranthene	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Butylbenzylphthalate	350	U	370 U			350	U	360	U	380	U	370	U
Carbazole	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Chrysene	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Di-n-butylphthalate	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Di-n-octylphthalate	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Dibenzo(a,h)anthracene	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Dibenzofuran	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Diethylphthalate	350	U	370 U	U 390	U	350	U	360	U	380	U	370	
Dimethylphthalate	350	U	370 U			350	U	360	U	380	U	370	U
Fluoranthene	350	U	370 U			350	U	360	U	380		370	
Fluorene	350	U	370 U	U 390	U	350	U	360	U	380			
Hexachlorobenzene	350	U	370 U	U 390	U	350	U	360	U	380	U	370	
Hexachlorobutadiene	350	U	370 U	U 390	U	350	U	360	U	380	U	370	_
Hexachlorocyclopentadiene	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Hexachloroethane	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Indeno(1,2,3-cd)pyrene	350	U	370 U	U 390	U	350	U	360	U	380	U	370	-
Isophorone	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
N-Nitroso-di-n-propylamine	350	U	370 U	U 390	U	350	U	360	U	380		370	
N-Nitrosodiphenylamine	350	U	370 U	U 390	U	350	U	360	U	380	U	370	-
Naphthalene	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Nitrobenzene	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Pentachlorophenol	1800	U	1900 U	U 2000	U	1800	U	1900	U	1900	U	1900	U
Phenanthrene	350	U	370 U			350	U	360	U	380	U	370	
Phenol	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
Pyrene	350	U	370 U	U 390	U	350	U	360	U	380	U	370	
bis(2-Chloroethoxy)methane	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
bis(2-Chloroethyl)ether	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U
bis(2-Ethylhexyl)phthalate	350	U	370 U	U 390	U	350	U	360	U	380	U	370	U

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION PRELIMINARY ASSESSMENT SITES, CTO-0190

SAMPLE ID	IR78-1120-IS01-01		IR78-1120-IS01-05		IR78-1120-IS02-01		IR78-1120-IS02-04		IR78-1120-IS03-01		IR78-1120-IS03-05		IR78-1409-IS01-01	
SAMPLE DATE	06-28-2002		06-28-2002		06-28-2002		06-28-2002		06-28-2002		06-28-2002		06-28-2002	
SAMPLE DEPTH (feet)	1-2		10.5		1-3		7.5		1-2		10		1.5	,
METALS (mg/kg)														1
Aluminum	300		1900		1800		610		2100		780		1500	
Antimony	0.47	J	0.38 U	UJ	0.41 U	UJ	0.36 U	IJ	0.75	J	0.39	UJ	0.47	UJ
Arsenic	0.32	J		U	0.51	J	0.26	U	0.6	J	0.28	U	0.27	
Barium	2		3.4		16		1.8		9		1.6		2.7	,
Beryllium	0.033	U	0.042	U	0.047	U	0.03	U	0.033	U	0.031	U	0.046	U
Cadmium	0.053	U	0.051	U	0.053	U	0.048	U	0.05	U	0.052	U	0.051	U
Calcium	450		38	J	2400		38	J	400		13	J	590	. 7
Chromium	0.8	J	13		1.7		1.2		2.2		1.6		1.5	. ,
Cobalt	0.09	J	0.25	J	0.17	J	0.094	J	0.1	J	0.1	J	0.087	J
Copper	0.082	J	0.59	J	0.97	J	0.11	J	0.98	J	0.11	J	0.38	J
Iron	63		360		550		120		1300		270		390	. /
Lead	1.2		2.9		4.1		1.3		3		1.6		2.8	, P
Magnesium	11	J	50	J	58	J	25	J	28	J	31	J	37	J
Manganese	2.2		3		1.8		1.4		18		1.3		2.2	, 1
Mercury	0.0048	U	0.0051	U	0.032		0.0053	U	0.018	J	0.0052	U	0.0051	U
Nickel	0.18	U	5.8		0.63	J	0.22	J	0.56	J	0.27	J	0.42	
Potassium	16	J	97	J	51	J	49	J	29	J	63	J	35	J
Selenium	0.52	U	0.49	U	0.52	U	0.47	U	0.49	U	0.51	U	0.49	U
Silver	0.15	U	0.14	U	0.15	U	0.13	U	0.14	U	0.14	U	0.14	U
Sodium	15	J	11	J	21	J	12	J	17	J	16	J	13	J
Thallium	0.67	U	0.64	U	0.67	U	0.6	U	0.63	U	0.65	U	0.64	U
Vanadium	0.58	J	3.1		2		1.1		3.5		1.7		1.2	, 1
Zinc	4.6		0.87	U	1.4	U	0.52	U	1.9	J	0.49	U	1.3	U

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION

## PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR78-1409-IS01-05	IR78-1409-IS02-01	IR78-1409-IS02-04	IR78-1409-IS03-01	IR78-1409-IS03-04	IR78-1512-IS01-03	IR78-1512-IS01-05
SAMPLE DATE	06-28-2002	06-28-2002	06-28-2002	06-28-2002	06-28-2002	06-27-2002	06-27-2002
SAMPLE DEPTH (feet)	10	2	8.5	1-3	8.5	7	10
VOLATILES (ug/kg)							
1,1,1-Trichloroethane	6 U	4.3 U	5.4 U	J 4.7 <b>t</b>	J 5.8	U 6.2	U 6.2 U
1,1,2,2-Tetrachloroethane	6 U		5.4 U				
1,1,2-Trichloroethane	6 U		5.4 U				
1,1-Dichloroethane	6 U		5.4 U				
1,1-Dichloroethene	6 U	4.3 U	5.4 U				
1,2-Dichloroethane	6 U	4.3 U	5.4 U				
1,2-Dichloropropane	6 U	4.3 U	5.4 U				
2-Butanone (MEK)	30 U		27 U				
2-Hexanone	30 U		27 U				
4-Methyl-2-pentanone (MIBK)	30 U		27 U				
Acetone (WIDK)	60 UJ		54 U.				
Benzene	6 U		5.4 U				
Bromodichloromethane	6 U		5.4 U				
Bromoform	6 U		5.4 U				
Bromomethane (Methyl bromide)	12 U		11 U				
Carbon disulfide	6 U		5.4 U				
Carbon tetrachloride	6 U		5.4 U				
Chlorobenzene	6 U		5.4 U				
Chloroethane	12 U		11 U				
Chloroform	6 U		5.4 U				
Chloromethane	12 U		11 U				
Cis/Trans-1,2-Dichloroethene	6 U		5.4 U				
Dibromochloromethane	6 U		5.4 U				
Ethylbenzene	6 U	4.3 U	5.4 U	J 4.7 U	J 5.8	U 6.2	U 6.2 U
Methylene chloride (Dichloromethane)	6 U	4.3 U	5.4 U	J 4.7 U	J 5.8	U 6.2	U 6.2 U
Styrene	6 U	4.3 U	5.4 U	J 4.7 <b>U</b>	J 5.8	U 6.2	U 6.2 U
Tetrachloroethene	6 U	4.3 U	5.4 U	J 4.7 <b>U</b>	J 5.8	U 6.2	U 6.2 U
Toluene	6 U	4.3 U	5.4 U	J 4.7 <b>U</b>	J 5.8	U 6.2	U 6.2 U
Trichloroethene	6 U	4.3 U	5.4 U	J 4.7 <b>U</b>	J 5.8	U 6.2	U 6.2 U
Vinyl chloride	12 U	8.6 U	11 U	J 9.4 <b>U</b>	J 12	U 12	U 12 U
Xylenes, Total	12 U	8.6 U	11 U	J 9.4 <b>U</b>	J 12	U 12	U 12 U
cis-1,3-Dichloropropene	6 U	4.3 U	5.4 U	J 4.7 U	J 5.8	U 6.2	U 6.2 U
trans-1,3-Dichloropropene	6 U	4.3 U	5.4 U	J 4.7 U	J 5.8	U 6.2	U 6.2 U

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION

## PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR78-1409-IS01-05	IR78-1409-IS02-01	IR78-1409-IS02-04	IR78-1409-IS03-0	IR78-1409-IS03-	04	IR78-1512-IS01-03		IR78-1512-IS01-05
SAMPLE DATE	06-28-2002	06-28-2002	06-28-2002	06-28-2002			06-27-2002		06-27-2002
SAMPLE DEPTH (feet)	10	2	8.5	1-3	3	3.5	7		10
SEMIVOLATILES (ug/kg)									
1,2,4-Trichlorobenzene		U 360				00 U	350		350 U
1,2-Dichlorobenzene	400	U 360				00 U	350		350 U
1,3-Dichlorobenzene	400	U 360				00 U	350		350 U
1,4-Dichlorobenzene	400	U 360				00 U	350		350 U
2,2'-Oxybis(1-Chloropropane) (bis-2-chloroisopropyl ether)	400	U 360				00 U	350		350 U
2,4,5-Trichlorophenol	400	U 360				00 U	350		350 U
2,4,6-Trichlorophenol	400	U 360				00 U	350		350 U
2,4-Dichlorophenol	400	U 360	U 350	U 370	) U 4	00 U	350	U	350 U
2,4-Dimethylphenol	400	U 360	U 350	U 370	) U 4	00 U	350		350 U
2,4-Dinitrophenol	2100	U 1800		U 1900		00 U	1800		1800 UJ
2,4-Dinitrotoluene	400	U 360	U 350	U 370	) U 4	00 U	350	U	350 U
2,6-Dinitrotoluene	400	U 360	U 350	U 370	) U 4	00 U	350	U	350 U
2-Chloronaphthalene	400	U 360	U 350	U 370	) U 4	00 U	350	U	350 U
2-Chlorophenol	400	U 360	U 350	U 370	) U 4	00 U	350	U	350 U
2-Methylnaphthalene	400	U 360	U 350	U 370	) U 4	00 U	350	U	350 U
2-Methylphenol (o-Cresol)	400	U 360	U 350	U 370	) U 4	00 U	350	U	350 U
2-Nitroaniline	2100	U 1800	U 1800	U 1900	) U 21	00 U	1800	U	1800 U
2-Nitrophenol	400	U 360	U 350	U 370	) U 4	00 U	350	U	350 U
3,3'-Dichlorobenzidine	800	U 720	U 710	U 730	) U 8	00 U	700	U	700 U
3-Methylphenol/4-Methylphenol (m&p-Cresol)	400	U 360	U 350	U 370	) U 4	00 U	350	U	350 U
3-Nitroaniline	2100	U 1800	U 1800	U 1900	) U 21	00 U	1800	U	1800 U
4,6-Dinitro-2-methylphenol	2100	U 1800	U 1800	U 1900	) U 21	00 U	1800	UJ	1800 UJ
4-Bromophenylphenyl ether	400	U 360			) U 4	00 U	350	U	350 U
4-Chloro-3-methylphenol	400	U 360	U 350	U 370	) U 4	00 U	350	U	350 U
4-Chloroaniline	800	U 720			) U 8	00 U	700	U	700 U
4-Chlorophenylphenyl ether	400	U 360			) U 4	00 U	350	U	350 U
4-Nitroaniline	2100	U 1800	U 1800	U 1900	) U 21	00 U	1800	U	1800 U
4-Nitrophenol	2100	U 1800			) U 21	00 U	1800	U	1800 U
Acenaphthene	400	U 360				00 U	350		350 U
Acenaphthylene	400	U 360	U 350	U 370	) U 4	00 U	350	U	350 U
Anthracene	400	U 360				00 U	350		350 U
Benzo(a)anthracene	400	U 360				00 U	350		350 U
Benzo(a)pyrene		U 360				00 U	350		350 U
		T. 260				00 11	250		250 11

350 U

350 U

370 U

370 U

400 U

400 U

360 U

360 U

400 U

400 U

Benzo(b)fluoranthene

Benzo(g,h,i)perylene

350 U

350 U

350 U

350 U

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION

## PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID IR78-1409		IR78-1409-IS02-01		IR78-1409-IS02-04		IR78-1409-IS03-01		IR78-1409-IS03-04		IR78-1512-IS01-03		IR78-1512-IS01-05	
	28-2002	06-28-2002		06-28-2002		06-28-2002		06-28-2002		06-27-2002		06-27-2002	
SAMPLE DEPTH (feet)	10	2		8.5		1-3		8.5		7		10	
SEMIVOLATILES (ug/kg) cont'd													
Benzo(k)fluoranthene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Butylbenzylphthalate	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Carbazole	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Chrysene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Di-n-butylphthalate	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Di-n-octylphthalate	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Dibenzo(a,h)anthracene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Dibenzofuran	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Diethylphthalate	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Dimethylphthalate	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Fluoranthene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Fluorene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Hexachlorobenzene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Hexachlorobutadiene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Hexachlorocyclopentadiene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Hexachloroethane	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Indeno(1,2,3-cd)pyrene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Isophorone	400	U 360	U	350	U	370	U	400	U	350	U	350	U
N-Nitroso-di-n-propylamine	400	U 360	U	350	U	370	U	400	U	350	U	350	U
N-Nitrosodiphenylamine	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Naphthalene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Nitrobenzene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Pentachlorophenol	2100	U 1800	U	1800	U	1900	U	2100	U	1800	U	1800	U
Phenanthrene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Phenol	400	U 360	U	350	U	370	U	400	U	350	U	350	U
Pyrene	400	U 360	U	350	U	370	U	400	U	350	U	350	U
bis(2-Chloroethoxy)methane	400	U 360	U	350	U	370	U	400	U	350	U	350	U
bis(2-Chloroethyl)ether	400	U 360	U	350	U	370		400	U	350	U	350	U
bis(2-Ethylhexyl)phthalate	400	U 360	U	350	U	370	U	810		350	U	260	J

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION PRELIMINARY ASSESSMENT SITES, CTO-0190

SAMPLE ID	IR78-1409-IS01-05	IR78-1409-IS02-01	IR78-1409-IS02-04	IR78-1409-IS03-01	IR78-1409-IS03-04	IR78-1512-IS01-03	IR78-1512-IS01-05
SAMPLE DATE	06-28-2002	06-28-2002	06-28-2002	06-28-2002	06-28-2002	06-27-2002	06-27-2002
SAMPLE DEPTH (feet)	10	2	8.5	1-3	8.5	7	10
							·
METALS (mg/kg)							
Aluminum	3500	2900	2000	4700	3000	540	
Antimony	0.5 U				J 0.42		
Arsenic	1.3	0.56 J	J 0.44 J	J 0.77	J 0.88	J 0.38	U 0.38 U
Barium	4.8	7.8	3	11	4.5	3	64
Beryllium	0.083	U 0.063 U	J 0.07 U	J 0.083	U 0.076	U 0.013	3 J 0.028 J
Cadmium	0.055	U 0.049 U	J 0.049 U	U 0.056	U 0.055	U 0.058	3 U 0.15 J
Calcium	88	650	26 J	J 5000	29	J 67	17000
Chromium	6.1	3.5	3	5.2	4.4	0.66	5 J 3.7
Cobalt	0.24	J 0.19 J	J 0.16 J	J 0.33	J 0.26	J 0.068	8 U 0.068 U
Copper	0.76	J 0.83 J	J 0.18 J	J 1.3	J 0.73	J 0.1	
Iron	2600	1500	930	2400	1700	110	) J 580 J
Lead	4	12	1.8	5.9	4.4	0.99	29
Magnesium	140	J 87 J	J 70 J	J 220	J 150		
Manganese	2.9	4.6	1.3	7.3	3.1	1.4	
Mercury	0.0061				0.0055		
Nickel	0.41	J 0.64 J		J 0.99	J 0.38		
Potassium	230	100	81 J	J 160	170	21	
Selenium	0.54		J 0.48 U		U 0.54		
Silver	0.16						
Sodium	26	J 29 J	J 20 J	J 29	J 20		0 U 69 U
Thallium		U 0.62 U					
Vanadium	9.3	4.7	3.4	7.3	6.6	0.88	
Zinc	1.7	J 2.5	0.83 U		1.5	J 0.16	

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION PRELIMINARY ASSESSMENT SITES, CTO-0190

SAMPLE ID SAMPLE DATE	IR78-1512-IS02-04 06-27-2002		IR78-1512-IS02-05 06-27-2002		IR78-1512-IS03-02 06-27-2002		IR78-1512-IS03-05 06-27-2002
SAMPLE DEPTH (feet)	8		9.5		4		10
S. IVII 22 221 III (1660)			7.0		•		10
VOLATILES (ug/kg)							
1,1,1-Trichloroethane		U	5.5	U	5.1	U	5.3 U
1,1,2,2-Tetrachloroethane		U	5.5	U		U	5.3 U
1,1,2-Trichloroethane		U	5.5	U		U	5.3 U
1,1-Dichloroethane		U	5.5	U	5.1	U	5.3 U
1,1-Dichloroethene		U	5.5	U		U	5.3 U
1,2-Dichloroethane		U	5.5	U	5.1	U	5.3 U
1,2-Dichloropropane	5.3	U	5.5	U	5.1	U	5.3 U
2-Butanone (MEK)	27	U	28	U	26	U	27 U
2-Hexanone	27	U	28	U	26	U	27 U
4-Methyl-2-pentanone (MIBK)	27	U	28	U	26	U	27 U
Acetone	53	U	55	U	10	J	53 U
Benzene	5.3	U	5.5	U	5.1	U	5.3 U
Bromodichloromethane	5.3	U	5.5	U	5.1	U	5.3 U
Bromoform	5.3	U	5.5	U	5.1	U	5.3 U
Bromomethane (Methyl bromide)	11	U	11	U	10	U	11 U
Carbon disulfide	5.3	U	5.5	U	5.1	U	5.3 U
Carbon tetrachloride	5.3	U	5.5	U	5.1	U	5.3 U
Chlorobenzene	5.3	U	5.5	U	5.1	U	5.3 U
Chloroethane	11	U	11	U	10	U	11 U
Chloroform	5.3	U	5.5	U	5.1	U	5.3 U
Chloromethane	11	U	11	U	10	U	11 U
Cis/Trans-1,2-Dichloroethene	5.3	U	5.5	U	5.1	U	5.3 U
Dibromochloromethane		U	5.5	U	5.1	U	5.3 U
Ethylbenzene	5.3	U	5.5	U	5.1	U	5.3 U
Methylene chloride (Dichloromethane)	5.3	U	5.5	U	5.1	U	5.3 U
Styrene	5.3	U	5.5	U	5.1	U	5.3 U
Tetrachloroethene	5.3	U	5.5	U	5.1	U	5.3 U
Toluene		Ü	5.5	Ū	5.1	Ū	5.3 U
Trichloroethene		Ü	5.5	Ū	5.1	Ū	5.3 U
Vinyl chloride		Ü	11	Ü	10	Ū	11 U
Xylenes, Total		Ü	11	Ü	10	Ü	11 U
cis-1,3-Dichloropropene		U	5.5	Ü	5.1	Ü	5.3 U
trans-1,3-Dichloropropene		Ü	5.5	Ü	5.1		5.3 U
· · · · · · · · · · · · · · · · · · ·	2.5	-	0.0	-	V.1	-	2.5

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION PRELIMINARY ASSESSMENT SITES, CTO-0190

SAMPLE ID	IR78-1512-IS02-04		IR78-1512-IS02-05		IR78-1512-IS03-02		IR78-1512-IS03-05	
SAMPLE DATE	06-27-2002		06-27-2002		06-27-2002		06-27-2002	
SAMPLE DEPTH (feet)	8		9.5		4		10	
SEMIVOLATILES (ug/kg)								
1,2,4-Trichlorobenzene	380	U	380	U	350	U	380	U
1,2-Dichlorobenzene	380	U	380	U	350	U	380	U
1,3-Dichlorobenzene	380	U	380	U	350	U	380	U
1,4-Dichlorobenzene	380	U	380	U	350	U	380	U
2,2'-Oxybis(1-Chloropropane) (bis-2-chloroisopropyl ether)	380	U	380	U	350	U	380	U
2,4,5-Trichlorophenol	380	U	380	U	350	U	380	U
2,4,6-Trichlorophenol	380	U	380	U	350	U	380	U
2,4-Dichlorophenol	380	U	380	U	350	U	380	U
2,4-Dimethylphenol	380	U	380	U	350	U	380	U
2,4-Dinitrophenol	2000	UJ	2000	UJ	1800	UJ	2000	U
2,4-Dinitrotoluene	380	U	380	U	350	U	380	U
2,6-Dinitrotoluene	380	U	380	U	350	U	380	U
2-Chloronaphthalene	380	U	380	U	350	U	380	U
2-Chlorophenol	380	U	380	U	350	U	380	U
2-Methylnaphthalene	380	U	380	U	350	U	380	U
2-Methylphenol (o-Cresol)	380	U	380	U	350	U	380	U
2-Nitroaniline	2000	U	2000	U	1800	U	2000	U
2-Nitrophenol	380	U	380	U	350	U	380	U
3,3'-Dichlorobenzidine	760	U	760	U	700	U	760	U
3-Methylphenol/4-Methylphenol (m&p-Cresol)	380	U	380	U	350	U	380	U
3-Nitroaniline	2000	U	2000	U	1800	U	2000	U
4,6-Dinitro-2-methylphenol	2000		2000		1800		2000	
4-Bromophenylphenyl ether	380	U	380	U	350	U	380	U
4-Chloro-3-methylphenol	380	U	380	U	350	U	380	U
4-Chloroaniline	760	U	760	U	700	U	760	
4-Chlorophenylphenyl ether	380	U	380	U	350	U	380	U
4-Nitroaniline	2000	U	2000	U	1800	U	2000	U
4-Nitrophenol	2000	U	2000	U	1800	U	2000	
Acenaphthene	380	U	380	U	350	U	380	U
Acenaphthylene	380	U	380	U	350	U	380	U
Anthracene	380	U	380	U	350	U	380	U
Benzo(a)anthracene	380	U	45	J	350	U	380	U
Benzo(a)pyrene	380	U	74	J	350	U	380	U
Benzo(b)fluoranthene	380	U	70	J	350	U	380	
Benzo(g,h,i)perylene	380	U	74	J	350	U	380	U

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID SAMPLE DATE SAMPLE DEPTH (feet)	IR78-1512-IS02-04 06-27-2002 8		IR78-1512-IS02-05 06-27-2002 9.5		IR78-1512-IS03-02 06-27-2002 4		IR78-1512-IS03-05 06-27-2002 10
SEMIVOLATILES (ug/kg) cont'd							
Benzo(k)fluoranthene	380	U	66	J	350	U	380 U
Butylbenzylphthalate	380	U	380	U	350	U	380 U
Carbazole	380	U	380	U	350	U	380 U
Chrysene	380	U	68	J	350	U	380 U
Di-n-butylphthalate	380	U	380	U	350	U	380 U
Di-n-octylphthalate	380	U	380	U	350	U	380 U
Dibenzo(a,h)anthracene	380	U	380	U	350	U	380 U
Dibenzofuran	380	U	380	U	350	U	380 U
Diethylphthalate	380	U	380	U	350	U	380 U
Dimethylphthalate	380	U	380	U	350	U	380 U
Fluoranthene	380	U	120	J	350	U	380 U
Fluorene	380	U	380	U	350	U	380 U
Hexachlorobenzene	380	U	380	U	350	U	380 U
Hexachlorobutadiene	380	U	380	U	350	U	380 U
Hexachlorocyclopentadiene	380	U	380	U	350	U	380 U
Hexachloroethane	380	U	380	U	350	U	380 U
Indeno(1,2,3-cd)pyrene	380	U	380	U	350	U	380 U
Isophorone	380	U	380	U	350	U	380 U
N-Nitroso-di-n-propylamine	380	U	380	U	350	U	380 U
N-Nitrosodiphenylamine	380	U	380	U	350	U	380 U
Naphthalene	380	U	380	U	350	U	380 U
Nitrobenzene	380	U	380	U	350	U	380 U
Pentachlorophenol	2000	U	2000	U	1800	U	2000 U
Phenanthrene	380	U	44	J	350	U	380 U
Phenol	380	U	380	U	350	U	380 U
Pyrene	380	U	83	J	350	U	380 U
bis(2-Chloroethoxy)methane	380	U	380	U	350	U	380 U
bis(2-Chloroethyl)ether	380	U	380	U	350	U	380 U
bis(2-Ethylhexyl)phthalate	380	U	440		350	U	380 U

## SOIL ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION PRELIMINARY ASSESSMENT SITES, CTO-0190 MCB, CAMP LEJEUNE, NORTH CAROLINA

SAMPLE ID	IR78-1512-IS02-04		IR78-1512-IS02-05		IR78-1512-IS03-02		IR78-1512-IS03-05	
SAMPLE DATE	06-27-2002		06-27-2002		06-27-2002		06-27-2002	
SAMPLE DEPTH (feet)	8		9.5		4		10	
METALS (mg/kg)								
Aluminum	3900	J	3000	J	1500	J	4200	J
Antimony	0.41	U	0.41	U	0.41	U	0.41	U
Arsenic	1.9		0.7	J	0.41	U	0.41	U
Barium	5.9		6.6		5.6		5.6	
Beryllium	0.049	J	0.04	J	0.024	J	0.053	J
Cadmium	0.063	U	0.063	U	0.064	U	0.063	U
Calcium	460		1000		290		100	
Chromium	6.1		6		2.4		5.7	
Cobalt	0.095	J	0.073	U	0.074	U	0.11	J
Copper	0.66	J	0.84	J	0.51	J	0.72	J
Iron	2700	J	1700	J	840	J	1000	J
Lead	3		3.4		2.9		3.2	
Magnesium	150		120		42	J	170	
Manganese	2.4		4.7		2.9		3.7	
Mercury	0.0048	U	0.0052	U	0.018	J	0.0052	U
Nickel	0.52	J	0.52	J	0.3	J	0.56	
Potassium	200		140		50	J	220	
Selenium	0.34	U	0.34	U	0.35	U	0.34	U
Silver	0.052	U	0.052	U	0.053	U	0.052	
Sodium	36	Ū	43	Ū	26	Ū	27	
Thallium	0.53	U	0.53	U	0.54	U	0.53	
Vanadium	8.4	-	6.9	-	2.4	-	7.1	-
Zinc	1.3	J	2.2		1.4	J	1.6	J

## GROUNDWATER ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION

## PRELIMINARY ASSESSMENT SITES, CTO-0190

SAMPLE ID SAMPLE DATE	IR78-1120-TW01-02B 07-01-2002	IR78-1120-TW02-02B 07-01-2002	IR78-1120-TW03-02B 07-01-2002	IR78-1409-TW01-02B 07-01-2002			IR78-1512-TW01-02B 07-01-2002
VOLATILES (ug/L)							
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5
1,1-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	5 U	5
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	5 U	5
2-Butanone (MEK)	25 U	25 U	25 U	25 U	25 U	25 U	25
2-Hexanone	25 U	25 U	25 U	25 U	25 U	25 U	25
4-Methyl-2-pentanone (MIBK)	25 U	25 U	25 U	25 U	25 U	25 U	25
Acetone	50 U	50 U	50 U	50 U	50 U	50 U	50
Benzene	5 U	5 U	5 U	5 U	5 U	5 U	5
Bromodichloromethane	0.78 J	2 J	2.4 J	5.6	5 U	5 U	0.61
Bromoform	5 U	5 U	5 U	5 U	5 U	5 U	5
Bromomethane (Methyl bromide)	10 U	10 U	10 U	10 U	10 U	10 U	10
Carbon disulfide	5 U	5 U	5 U	5 U	5 U	5 U	5
Carbon tetrachloride	5 U	5 U	5 U	5 U	5 U	5 U	5
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	5 U	5
Chloroethane	10 U	10 U	10 U	10 U	10 U	10 U	10
Chloroform	3.4 J	8.7	7	31	1.5 J	5 U	2.7
Chloromethane	10 U	10 U	10 U	10 U	10 U	10 U	10
Cis/Trans-1,2-Dichloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5
Dibromochloromethane	5 U	5 U	0.84 J	1.3 J	5 U	5 U	5
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	5 U	5
Methylene chloride (Dichloromethane)	5 U	5 U	5 U	5 U	5 U	5 U	5
Styrene	5 U	5 U	5 U	5 U	5 U	5 U	5
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U	5 U	5
Toluene	5 U	5 U	5 U	5 U	5 U	5 U	5
Trichloroethene	5 U	5 U	0.65 J	5 U	5 U	5 U	5
Vinyl chloride	10 U	10 U	10 U	10 U	10 U	10 U	10
Xylenes, Total	10 U	10 U	10 U	10 U	10 U	10 U	10
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	5 U	5

## GROUNDWATER ANAYTICAL RESULTS

## HPIA PA SITES FIELD INVESTIGATION

## PRELIMINARY ASSESSMENT SITES, CTO-0190

SAMPLE ID SAMPLE DATE	IR78-1120-TW01-02B 07-01-2002	IR78-1120-TW02-02B 07-01-2002	IR78-1120-TW03-02B 07-01-2002	IR78-1409-TW01-02B 07-01-2002	IR78-1409-TW02-02B 07-01-2002	IR78-1409-TW03-02B 07-01-2002	IR78-1512-TW01-02B 07-01-2002
SEMIVOLATILES (ug/L)							
1,2,4-Trichlorobenzene	10 U	10					
1,2-Dichlorobenzene	10 U	10					
1,3-Dichlorobenzene	10 U	10					
1,4-Dichlorobenzene	10 U	10					
2,2'-Oxybis(1-Chloropropane) (bis-2-chloroisopropyl ether)	10 U	10 U	10 U	10 U	10 U	10 U	10
2,4,5-Trichlorophenol	10 U	10					
2,4,6-Trichlorophenol	10 U	10					
2,4-Dichlorophenol	10 U	10					
2,4-Dimethylphenol	10 U	10					
2,4-Dinitrophenol	50 U	50					
2,4-Dinitrotoluene	10 U	10					
2,6-Dinitrotoluene	10 U	10					
2-Chloronaphthalene	10 U	10					
2-Chlorophenol	10 U	10					
2-Methylnaphthalene	10 U	10					
2-Methylphenol (o-Cresol)	10 U	10					
2-Nitroaniline	50 U	50					
2-Nitrophenol	10 U	10					
3,3'-Dichlorobenzidine	20 U	20					
3-Methylphenol/4-Methylphenol (m&p-Cresol)	10 U	10					
3-Nitroaniline	50 U	50					
4,6-Dinitro-2-methylphenol	50 U	50					
4-Bromophenylphenyl ether	10 U	10					
4-Chloro-3-methylphenol	10 U	10					
4-Chloroaniline	20 U	20					
4-Chlorophenylphenyl ether	10 U	10					
4-Nitroaniline	50 U	50					
4-Nitrophenol	50 U	50					
Acenaphthene	10 U	10					
Acenaphthylene	10 U	10					
Anthracene	10 U	10					
Benzo(a)anthracene	10 U	10					
Benzo(a)pyrene	10 U	10					
Benzo(b)fluoranthene	10 U	10					
Benzo(g,h,i)perylene	10 U	10					
Benzo(k)fluoranthene	10 U	10					
Butylbenzylphthalate	10 U	10					
Carbazole	10 U	10					
Chrysene	10 U	10					

## GROUNDWATER ANAYTICAL RESULTS HPIA PA SITES FIELD INVESTIGATION

#### III IA I A SITES FIELD INVESTIGATION

## PRELIMINARY ASSESSMENT SITES, CTO-0190

SAMPLE ID	IR78-1120-TW01-02B	IR78-1120-TW02-02B	IR78-1120-TW03-02B	IR78-1409-TW01-02B	IR78-1409-TW02-02B	IR78-1409-TW03-02B	IR78-1512-TW01-02B
SAMPLE DATE	07-01-2002	07-01-2002	07-01-2002	07-01-2002	07-01-2002	07-01-2002	07-01-2002
SEMIVOLATILES (ug/L) cont'd							
Di-n-butylphthalate	10 U	10					
Di-n-octylphthalate	10 U	10					
Dibenzo(a,h)anthracene	10 U	10					
Dibenzofuran	10 U	10					
Diethylphthalate	10 U	10					
Dimethylphthalate	10 U	10					
Fluoranthene	10 U	10					
Fluorene	10 U	10					
Hexachlorobenzene	10 U	10					
Hexachlorobutadiene	10 U	10					
Hexachlorocyclopentadiene	10 U	10 U	10 U	10 U	10 U	10 U	10
Hexachloroethane	10 U	10					
Indeno(1,2,3-cd)pyrene	10 U	10					
Isophorone	10 U	10					
N-Nitroso-di-n-propylamine	10 U	10 U	10 U	10 U	10 U	10 U	10
N-Nitrosodiphenylamine	10 U	10					
Naphthalene	10 U	10					
Nitrobenzene	10 U	10					
Pentachlorophenol	50 U	50					
Phenanthrene	10 U	10					
Phenol	10 U	10					
Pyrene	10 U	10					
bis(2-Chloroethoxy)methane	10 U	10 U	10 U	10 U	10 U	10 U	10
bis(2-Chloroethyl)ether	10 U	10					
bis(2-Ethylhexyl)phthalate	10 U	10 U	10 U	10 U	10 U	10 U	10

## GROUNDWATER ANAYTICAL RESULTS HPIA PA SITES FIELD INVESTIGATION

## PRELIMINARY ASSESSMENT SITES, CTO-0190

SAMPLE ID	IR78-1120-TW01-02B	IR78-1120-TW02-02B	IR78-1120-TW03-02B	IR78-1409-TW01-02B	IR78-1409-TW02-02B	IR78-1409-TW03-02B	IR78-1512-TW01-02B
SAMPLE DATE	07-01-2002	07-01-2002	07-01-2002	07-01-2002	07-01-2002	07-01-2002	07-01-2002
METALS (ug/L)							
Aluminum	2500	640	8000	190 U	1800	460	3100
Antimony	3.9 U	3.9					
Arsenic	3.9 U	3.9					
Barium	86	57	65	15	68	34	43
Beryllium	0.38 J	0.11 J	0.3 J	0.1 U	0.12 J	0.1 U	0.13
Cadmium	0.6 U	0.6					
Calcium	29000	11000	9900	14000	34000	40000	5100
Chromium	2.5 J	0.9 U	8.4 J	0.9 U	2.3 J	1.1 J	5
Cobalt	1.6 J	0.7 U	1.7 J	0.7 U	0.7 U	0.7 U	0.7
Copper	1.1 J	1 U	1.8 J	1 U	1 J	2.3 J	1.5
Iron	290	170	2100	73	790	9700	860
Lead	2.5 U	2.5 U	2.7 J	2.5 U	2.5 U	2.5 U	2.5
Magnesium	7500	2500	3500	1300	2800	1800	1500
Manganese	40	11	24	24	25	120	9.4
Mercury	0.1 U	0.1					
Nickel	3.4 J	1.7 U	3.2 J	1.7 U	1.7 U	3.1 J	1.9
Potassium	2100	1700	1800	1100	2300	1400	1700
Selenium	3.3 U	6.2					
Silver	0.5 U	0.5					
Sodium	12000	5600	4700	7700	6700	8800	5000
Thallium	5.1 U	5.1					
Vanadium	2.6 J	2 J	11	1.5 J	3.6 J	0.8 U	6.8
Zinc	3.3 J	2.7 J	8 J	4.6 J	2.4 J	19 J	4.4

SAMPLE ID		IR78-1512-TW02-02B		IR78-1512-TW03-02B
SAMPLE DATE		07-01-2002		07-01-2002
VOLATILES (ug/L)				
1,1,1-Trichloroethane	U	5	U	5 U
, , ,	U		U	5 U
, ,	U	5	U	5 U
1,1-Dichloroethane	U	5	U	5 U
1,1-Dichloroethene	U	5	U	5 U
1,2-Dichloroethane	U	5	U	5 U
1,2-Dichloropropane	U	5	U	5 U
2-Butanone (MEK)	U	25	U	25 U
2-Hexanone	U	25	U	25 U
4-Methyl-2-pentanone (MIBK)	U	25	U	25 U
Acetone	U	50	U	50 U
Benzene	U	5	U	5 U
Bromodichloromethane	J	3.3	J	5 U
Bromoform	U	5	U	5 U
Bromomethane (Methyl bromide)	U	10	U	10 U
Carbon disulfide	U	5	U	5 U
Carbon tetrachloride	U	5	U	5 U
Chlorobenzene	U	5	U	5 U
Chloroethane	U	10	U	10 U
Chloroform	J	15		1.2 J
Chloromethane	U	10	U	10 U
Cis/Trans-1,2-Dichloroethene	U	5	U	0.88 J
Dibromochloromethane	U	0.83	J	5 U
Ethylbenzene	U	5	U	5 U
Methylene chloride (Dichloromethane)	U	5	U	5 U
Styrene	U	5	U	5 U
Tetrachloroethene	U	5	U	5 U
Toluene	U	5	U	2.2 J
Trichloroethene	U	0.76	J	3.5 J
Vinyl chloride	U	10	U	10 U
	U	10	U	10 U
cis-1,3-Dichloropropene	U	5	U	5 U
	U	5	U	5 U

SAMPLE ID SAMPLE DATE	·	IR78-1512-TW02-02B 07-01-2002		IR78-1512-TW03-02B 07-01-2002
SEMIVOLATILES (ug/L)				
1,2,4-Trichlorobenzene	U	10	U	10 U
1,2-Dichlorobenzene	U	10	U	10 U
1,3-Dichlorobenzene	U	10	U	10 U
1,4-Dichlorobenzene	U	10	U	10 U
2,2'-Oxybis(1-Chloropropane) (bis-2-chloroisopropyl ether)	U	10	U	10 U
2,4,5-Trichlorophenol	U	10	U	10 U
2,4,6-Trichlorophenol	U	10	U	10 U
2,4-Dichlorophenol	U	10	U	10 U
2,4-Dimethylphenol	U	10	U	10 U
2,4-Dinitrophenol	U	50	U	50 U
2,4-Dinitrotoluene	U	10	U	10 U
2,6-Dinitrotoluene	U	10	U	10 U
2-Chloronaphthalene	U	10	U	10 U
2-Chlorophenol	U	10	U	10 U
2-Methylnaphthalene	U	10	U	10 U
2-Methylphenol (o-Cresol)	U	10	U	10 U
2-Nitroaniline	U	50	U	50 U
2-Nitrophenol	U	10	U	10 U
3,3'-Dichlorobenzidine	U	20	U	20 U
3-Methylphenol/4-Methylphenol (m&p-Cresol)	U	10	U	10 U
3-Nitroaniline	U	50	U	50 U
4,6-Dinitro-2-methylphenol	U	50	U	50 U
4-Bromophenylphenyl ether	U	10	U	10 U
4-Chloro-3-methylphenol	U	10	U	10 U
4-Chloroaniline	U	20	U	20 U
4-Chlorophenylphenyl ether	U	10	U	10 U
4-Nitroaniline	U	50	U	50 U
4-Nitrophenol	U	50	U	50 U
Acenaphthene	U	10	U	10 U
Acenaphthylene	U	10	U	10 U
Anthracene	U	10	U	10 U
Benzo(a)anthracene	U	10	U	10 U
Benzo(a)pyrene	U	10	U	10 U
Benzo(b)fluoranthene	U	10	U	10 U
Benzo(g,h,i)perylene	U	10	U	10 U
Benzo(k)fluoranthene	U	10	U	10 U
Butylbenzylphthalate	U	10	U	10 U
Carbazole	U	10	U	10 U
Chrysene	U	10	U	10 U

SAMPLE ID SAMPLE DATE	IR78-1512-TW02-02B 07-01-2002	IR78-1512-TW03-02B 07-01-2002
SEMIVOLATILES (ug/L) cont'd		
Di-n-butylphthalate U	10 U	J 10 U
Di-n-octylphthalate U	10 U	J 10 U
Dibenzo(a,h)anthracene U	10 U	J 10 U
Dibenzofuran U	10 U	J 10 U
Diethylphthalate U	10 U	J 10 U
Dimethylphthalate U	10 U	J 10 U
Fluoranthene U	10 U	J 10 U
Fluorene U	10 U	J 10 U
Hexachlorobenzene U	10 U	J 10 U
Hexachlorobutadiene U	10 U	J 10 U
Hexachlorocyclopentadiene U	10 U	J 10 U
Hexachloroethane U	10 U	J 10 U
Indeno(1,2,3-cd)pyrene U	10 U	J 10 U
Isophorone U	10 U	J 10 U
N-Nitroso-di-n-propylamine U	10 U	J 10 U
N-Nitrosodiphenylamine U	10 U	J 10 U
Naphthalene U	10 U	J 10 U
Nitrobenzene U	10 U	J 10 U
Pentachlorophenol U	50 U	J 50 U
Phenanthrene U	10 U	J 10 U
Phenol U	10 U	J 10 U
Pyrene U	10 U	J 10 U
bis(2-Chloroethoxy)methane U	10 U	J 10 U
bis(2-Chloroethyl)ether U	10 U	J 10 U
bis(2-Ethylhexyl)phthalate U	10 U	J 10 U

SAMPLE ID	IR78-1512-TW02-02B	IR78-1512-TW03-02B	
SAMPLE DATE	07-01-2002	07-01-2002	
METALS (ug/L)			
Aluminum	1400	79000	
Antimony U	3.9	U 3.9	U
Arsenic U	3.9	U 11	
Barium	18	220	
Beryllium J	0.1	U 0.96	J
Cadmium U	0.6	U 0.6	U
Calcium	32000	9300	
Chromium J	1.5	J 64	
Cobalt U	0.7	U 7.4	J
Copper J	1	U 5.2	J
Iron	400	16000	
Lead U	2.5	U 18	
Magnesium	2100	3200	
Manganese J	11	46	
Mercury U	0.1	U 0.1	U
Nickel J	1.7	U 34	J
Potassium	1300	5400	
Selenium J	3.3	U 11	
Silver U	0.5	U 0.5	U
Sodium	5400	5600	
Thallium U	5.1	U 5.1	U
Vanadium J	7	J 66	
Zinc J	1.7	J 28	

SAMPLE ID SAMPLE DATE	IR78-TB06-02A 06-27-2002		IR78-TB07-02B 06-28-2002		IR78-TB08-02B 07-01-2002	
VOLATILES (ug/L)						
1,1,1-Trichloroethane	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane	5	U	5	U	5	U
1,1,2-Trichloroethane	5	U	5	U	5	U
1,1-Dichloroethane	5	U	5	U	5	U
1,1-Dichloroethene	5	U	5	U	5	U
1,2-Dichloroethane	5	U	5	U	5	U
1,2-Dichloropropane	5	U	5	U	5	U
2-Butanone (MEK)	25	U	25	U	25	U
2-Hexanone	25	U	25	U	25	U
4-Methyl-2-pentanone (MIBK)	25	U	25	U	25	U
Acetone	50	U	50	UJ	50	U
Benzene	5	U	5	U	5	U
Bromodichloromethane	5	U	5	U	5	U
Bromoform	5	U	5	U	5	U
Bromomethane (Methyl bromide)	10	U	10	U	10	U
Carbon disulfide	5	U	5	U	5	U
Carbon tetrachloride	5	U	5	U	5	U
Chlorobenzene	5	U	5	U		U
Chloroethane	10	U	10	U	10	U
Chloroform		U	5	U		U
Chloromethane	10		10	U		U
Cis/Trans-1,2-Dichloroethene		U	5	U		U
Dibromochloromethane		U	5	U		U
Ethylbenzene		U	5	U		U
Methylene chloride (Dichloromethane)	2.6	-	5	U	0.3	J
Styrene		U	5	U	2.4	J
Tetrachloroethene		U	5	U		U
Toluene		U	5	U		U
Trichloroethene		U	5	U		U
Vinyl chloride	10		10	U		U
Xylenes, Total	10		10	U		U
cis-1,3-Dichloropropene		U	5	U		U
trans-1,3-Dichloropropene	5	U	5	U	5	U

## Appendix K Soil Analytical Results Air Station and Montford Point Site Investigations Preliminary Assessment Sites, CTO-190 MCB Camp Lejeune, North Carolina

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Sample ID	IRP1-SS-IS01-1-2	IRP1-SS-IS02-1-2	IRP2-SS-IS01-1-2	IRP2-SS-IS02-1-2		IRP2-SS-IS04-1-3	IRP3-SS-IS01-1-2		IRP3-SS-IS03-0-3	IRP3-SS-IS04-1-3	IRP4-SS-IS01-0-3	IRP4-SS-IS02-0-3	IRP4-SS-IS03-1-3		IRP5-SS-IS01-0-3	IRP5-SS-IS02-0-4	IRP5-SS-IS03-0-3		IRP5-SS-IS04-0-3	IRP1-SS-IS03-1-3	IRP1-SS-IS04-1-3
Sample Date	6/7/04	6/7/04	6/7/04	6/7/04	6/11/04	6/11/04	6/9/04	6/9/04	6/10/04	6/11/04	6/9/04	6/9/04	6/10/04	6/10/04	6/9/04	6/9/04	6/10/04	6/10/04	6/10/04	6/11/04	6/11/04
Chemical Name																					
Volatile Organic Compounds (UG/KG)																					
1,1,1-TRICHLOROETHANE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U 12 U
1,1,2,2-TETRACHLOROETHANE 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	18 U	19 U 19 U	17 U 17 U	13 U 13 U	13 U 13 U	12 U 12 U	16 U 16 U	12 U 12 U	11 U 11 U	12 U 12 U	14 U	11 U	14 U	13 U 13 U	11 U 11 U	12 U 12 U	11 U 11 U	11 U	12 U 12 U	12 U 12 U	12 U
1,1,2-TRICHLOROETHANE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
1,1-DICHLOROETHANE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
1,1-DICHLOROETHENE 1,2,4-TRICHLOROBENZENE	18 U 18 U	19 U 19 U	17 U	13 U	+	12 U 12 U	16 U	12 U 12 U	11 U	12 U 12 U	14 U	11 U	14 U 14 U	13 U 13 U	11 U 11 U	12 U 12 U	11 U	11 U	12 U 12 U	12 U 12 U	12 U 12 U
1,2-DIBROMO-3-CHLOROPROPANE	18 U	19 U	17 U	13 U	+	12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
1,2-DIBROMOETHANE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
1,2-DICHLOROBENZENE 1,2-DICHLOROETHANE	18 U 18 U	19 U 19 U	17 U	13 U 13 U		12 U 12 U	16 U	12 U 12 U	11 U	12 U 12 U	14 U	11 U 11 U	14 U	13 U 13 U	11 U	12 U 12 U	11 U 11 U	11 U	12 U 12 U	12 U 12 U	12 U 12 U
1,2-DICHLOROPROPANE	18 U	19 U	17 U	13 U	+	12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
1,3-DICHLOROBENZENE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
1,4-DICHLOROBENZENE 2-BUTANONE	18 U 18 U	19 U 19 U	17 U	13 U 13 U		12 U 12 U	16 U	12 U 12 U	11 U	12 U 12 U	14 U	11 U 11 U	14 U	13 U 13 U	11 U	12 U 12 U	11 U 11 U	11 U	12 U 12 U	12 U	12 U 3 J
2-HEXANONE	18 U	19 U	17 U	13 U	+	12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
4-METHYL-2-PENTANONE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	9 J	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
ACETONE BENZENE	18 U 18 U	36 19 U	17 U	73 13 U	13 U 13 U	21 12 U	16 U	12 U 12 U	11 U 11 U	21 12 U	14 U	11 U 11 U	14 U	13 U 13 U	11 U 11 U	12 U 12 U	11 U 11 U	11 U	12 U 12 U	70 12 U	15 12 U
BROMODICHLOROMETHANE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
BROMOFORM	18 UJ	19 UJ	17 UJ	13 UJ		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
BROMOMETHANE CARBON DISLILEIDE	18 UJ	19 UJ	17 UJ 17 U	13 UJ 13 U	+	12 U	16 U	12 U	11 U 11 U	12 U 12 U	14 U	11 U	14 U	13 U	11 U	12 U 12 U	11 U	11 U	12 U	12 U 12 U	12 U 12 U
CARBON DISULFIDE  CARBON TETRACHLORIDE	18 U 18 U	19 U 19 U	17 U	13 U		12 U 12 U	16 U 16 U	12 U 12 U	11 U	12 U	14 U	11 U 11 U	14 U 14 U	13 U 13 U	11 U	12 U	11 U 11 U	11 U	12 U 12 U	12 U	12 U
CHLOROBENZENE	18 U	19 U	17 U	13 U	13 U	12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
CHLOROETHANE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
CHLOROFORM CHLOROMETHANE	18 U 18 UJ	19 U 19 UJ	17 U 17 UJ	13 U 13 UJ		12 U 12 U	16 U 16 U	12 U 12 U	11 U 11 U	12 U 12 U	14 U	11 U 11 U	14 U 14 U	13 U 13 U	11 U 11 U	12 U 12 U	11 U	11 U	12 U 12 U	12 U 12 U	12 U 12 U
CIS-1,2-DICHLOROETHENE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
CIS-1,3-DICHLOROPROPENE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
CYCLOHEXANE DIBROMOCHLOROMETHANE	18 U 18 U	19 U 19 U	17 U	13 U	+	12 U 12 U	16 U	12 U 12 U	11 U	12 U 12 U	14 U	11 U	14 U 14 U	13 U 13 U	11 U 11 U	12 U 12 U	11 U	11 U	12 U 12 U	12 U 12 U	12 U 12 U
DICHLORODIFLUOROMETHANE	18 U	19 U	17 U	13 U	+	12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
ETHYLBENZENE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
ISOPROPYLBENZENE METHYL ACETATE	18 U 18 U	19 U 19 U	17 U	13 U 13 U		12 U 12 U	16 U	12 U 12 U	11 U	12 U 12 U	14 U	11 U 11 U	14 U	13 U 13 U	11 U	12 U 12 U	11 U	11 U	12 U 12 U	12 U 12 U	12 U 12 U
METHYL ACETATE METHYLCYCLOHEXANE	18 U	19 U	17 U	13 U	+	12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
METHYLENE CHLORIDE	18 U	19 U	17 U	13 U	+	3 J	16 U	12 U	2 J	3 J	14 U	11 U	14 U	3 J	11 U	12 U	2 J	11 U	4 J	12 U	12 U
METHYL-T-BUTYL ETHER	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
STYRENE TETRACHLOROETHENE	18 U 18 U	19 U 19 U	17 U	13 U 13 U	+	12 U 12 U	16 U	12 U 12 U	11 U 11 U	12 U 12 U	14 U	11 U 11 U	14 U 14 U	13 U 13 U	11 U 11 U	12 U 12 U	11 U 11 U	11 U	12 U 12 U	12 U 12 U	12 U 12 U
TOLUENE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
TRANS-1,2-DICHLOROETHENE	18 U	19 U	17 U	13 U		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
TRANS-1,3-DICHLOROPROPENE TRICHLOROETHENE	18 U 18 U	19 U 19 U	17 U	13 U 13 U		12 U 12 U	16 U	12 U 12 U	11 U	12 U 12 U	14 U	11 U 11 U	14 U	13 U 13 U	11 U 11 U	12 U 12 U	11 U 11 U	11 U	12 U 12 U	12 U 12 U	12 U 12 U
TRICHLOROFLUOROMETHANE	18 UJ	19 UJ	17 UJ	13 UJ		12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
VINYL CHLORIDE	18 U	19 U	17 U	13 U	+	12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
XYLENE (TOTAL)	18 U	19 U	17 U	13 U	13 U	12 U	16 U	12 U	11 U	12 U	14 U	11 U	14 U	13 U	11 U	12 U	11 U	11 U	12 U	12 U	12 U
Semivolatile Organic Compounds (UG/KG)																					
1,1'-BIPHENYL	380 U	380 U	380 U	370 U		400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
2,2'-OXYBIS(1-CHLOROPROPANE) 2,4,5-TRICHLOROPHENOL	380 U 950 U	380 U 950 U	380 U 950 U	370 U 930 U	380 R 940 U	400 U 1000 U	390 UJ 980 U	390 U 980 U	370 U 930 U	380 U 940 U	380 UJ 940 U	360 U 910 U	360 U 910 U	370 U 930 U	370 U 930 U	390 U 990 U	370 U 920 U	360 U 910 U	370 U 930 U	380 UJ 970 U	370 UJ 930 U
2,4,6-TRICHLOROPHENOL	380 U	380 U	380 U	370 U		400 U	390 U	390 U	370 U	380 U	380 U	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
2,4-DICHLOROPHENOL	380 U	380 U	380 U	370 U	+	400 U	390 U	390 U	370 U	380 U	380 U	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
2,4-DIMETHYLPHENOL 2.4-DINITROPHENOL	380 U 950 U	380 U 950 U	380 U 950 U	370 U 930 U	+	400 U 1000 U	390 U 980 U	390 U 980 U	370 U 930 U	380 U 940 U	380 U 940 U	360 U 910 U	360 U 910 U	370 U 930 U	370 U 930 U	390 U 990 U	370 U 920 U	360 U 910 U	370 U 930 U	380 U 970 UJ	370 U 930 UJ
2,4-DINITROTOLUENE	380 U	380 U	380 U	370 U	+	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
2,6-DINITROTOLUENE	380 U	380 U	380 U	370 U		400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
2-CHLORONAPHTHALENE 2-CHLOROPHENOL	380 U 380 U	380 U 380 U	380 U 380 U	370 U 370 U		400 U 400 U	390 UJ 390 U	390 U 390 U	370 U 370 U	380 U 380 U	380 UJ 380 U	360 U 360 U	360 U 360 U	370 U 370 U	370 U 370 U	390 U 390 U	370 U 370 U	360 U 360 U	370 U 370 U	380 U 380 U	370 U
2-METHYLNAPHTHALENE	380 U	380 U	380 U	370 U	+	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 UJ	370 UJ
2-METHYLPHENOL	380 U	380 U	380 U	370 U	+	400 U	390 U	390 U	370 U	380 U	380 U	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
2-NITROANILINE 2-NITROPHENOL	950 U 380 U	950 U 380 U	950 U 380 U	930 U 370 U	+	1000 U 400 U	980 UJ 390 U	980 U 390 U	930 U 370 U	940 U 380 U	940 UJ 380 U	910 U 360 U	910 U 360 U	930 U 370 U	930 U 370 U	990 U 390 U	920 U 370 U	910 U 360 U	930 U 370 U	970 U 380 U	930 U 370 U
3,3'-DICHLOROBENZIDINE	380 U	380 U	380 U	370 U	+	400 U	390 U	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
3-NITROANILINE	950 U	950 U	950 U	930 U	940 R	1000 U	980 UJ	980 U	930 U	940 U	940 UJ	910 U	910 U	930 U	930 U	990 U	920 U	910 U	930 U	970 U	930 U
4,6-DINITRO-2-METHYLPHENOL 4-BROMOPHENYL PHENYL ETHER	950 U	950 U	950 U	930 U		1000 U	980 U	980 U	930 U	940 U	940 U	910 U	910 U	930 U	930 U	990 U	920 U	910 U	930 U	970 UJ	930 UJ
4-BROMOPHENYL PHENYL ETHER 4-CHLORO-3-METHYLPHENOL	380 U 380 U	380 U 380 U	380 U 380 U	370 U 370 U		400 U 400 U	390 UJ 390 U	390 U 390 U	370 U 370 U	380 U 380 U	380 UJ 380 U	360 U 360 U	360 U 360 U	370 U 370 U	370 U 370 U	390 U 390 U	370 U 370 U	360 U 360 U	370 U 370 U	380 U 380 U	370 U 370 U
4-CHLOROANILINE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
4-CHLOROPHENYL PHENYL ETHER	380 U	380 U	380 U	370 U	+	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
4-METHYLPHENOL 4-NITROANILINE	380 U 950 U	380 U 950 U	380 U 950 U	370 U 930 U	380 U 940 R	400 U 1000 U	390 U 980 UJ	390 U 980 U	370 U 930 U	380 U 940 U	380 U 940 UJ	360 U 910 U	360 U 910 U	370 U 930 U	370 U 930 U	390 U 990 U	370 U 920 U	360 U 910 U	370 U 930 U	380 U 970 U	370 U 930 U
4-NITROPHENOL	950 U	950 U	950 U	930 U	940 U	1000 U	980 U	980 U	930 U	940 U	940 U	910 U	910 U	930 U	930 U	990 U	920 U	910 U	930 U	970 UJ	930 UJ
ACENAPHTHENE	380 U	380 U	380 U	370 U		400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
ACENAPHTHYLENE ACETOPHENONE	380 U 380 U	380 U 380 U	380 U 380 U	370 U 370 U	380 R 380 R	400 U 400 U	390 UJ 390 UJ	390 U 390 U	370 U 370 U	380 U 380 U	380 UJ 380 UJ	360 U 360 U	360 U 360 U	370 U 370 U	370 U 370 U	390 U 390 U	370 U 370 U	360 U 360 U	370 U 370 U	380 U 380 U	370 U 370 U
ANTHRACENE	380 U	380 U	380 U	370 U		400 U	390 UJ	150 J	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
ATRAZINE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
BENZALDEHYDE BENZO(A)ANTHRACENE	380 UJ	380 UJ	380 UJ	370 UJ	+	400 UJ	390 UJ	390 UJ	370 UJ	380 UJ	380 UJ	360 UJ	360 UJ	370 UJ	370 UJ	390 UJ	370 UJ	360 UJ	370 UJ	380 UJ	370 UJ
BENZO(A)ANTHRACENE BENZO(A)PYRENE	380 U 380 U	380 U 380 U	380 U 380 U	370 U 370 U	+	400 U 400 U	390 UJ 390 UJ	1,000 780	370 U 370 U	380 U 380 U	380 UJ 380 UJ	360 U 360 U	360 U 360 U	370 U 370 U	370 U 370 U	390 U 390 U	370 U 370 U	360 U 360 U	370 U 370 U	380 U 380 U	370 U 370 U
BENZO(B)FLUORANTHENE	380 U	380 U	380 U	370 U	+	400 U	390 UJ	770	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
BENZO(G,H,I)PERYLENE	380 U	380 U	380 U	370 U		400 U	390 UJ	170 J	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
		380 U	380 U	370 U	380 R	400 UJ	390 UJ	810	370 UJ	380 UJ	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
BENZO(K)FLUORANTHENE BIS(2-CHLOROETHOXY)METHANE	380 U 380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U

# Appendix K Soil Analytical Results Air Station and Montford Point Site Investigations Preliminary Assessment Sites, CTO-190 MCB Camp Lejeune, North Carolina

Sample ID	IRP1-SS-IS01-1-2	IRP1-SS-IS02-1-2	IRP2-SS-IS01-1-2	IRP2-SS-IS02-1-2	IRP2-SS-IS03-1-3	IRP2-SS-IS04-1-3	IRP3-SS-IS01-1-2	IRP3-SS-IS02-2-3	IRP3-SS-IS03-0-3	IRP3-SS-IS04-1-3	IRP4-SS-IS01-0-3	IRP4-SS-IS02-0-3	IRP4-SS-IS03-1-3	IRP4-SS-IS04-0-3	IRP5-SS-IS01-0-3	IRP5-SS-IS02-0-4	IRP5-SS-IS03-0-3	IRP5-SS-IS03-DUP-0-3	IRP5-SS-IS04-0-3	IRP1-SS-IS03-1-3	IRP1-SS-IS04-1-3
Sample Date	6/7/04	6/7/04	6/7/04	6/7/04	6/11/04	6/11/04	6/9/04	6/9/04	6/10/04	6/11/04	6/9/04	6/9/04	6/10/04	6/10/04	6/9/04	6/9/04	6/10/04	6/10/04	6/10/04	6/11/04	6/11/04
Chemical Name																					
BIS(2-CHLOROETHYL)ETHER	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 UJ	370 UJ
BIS(2-ETHYLHEXYL)PHTHALATE	380 U	380 U	380 U	840	380 R	470	390 UJ	390 U	430	380 U	140 J	360 U	360 U	370 U	150 J	83 J	370 U	360 U	370 U	380 U	370 U
BUTYL BENZYL PHTHALATE  CAPROLACTAM	380 U 380 U	380 U 380 U	380 U 380 U	370 U 370 U	380 R 380 R	400 U 400 U	390 UJ 97 J	390 U 390 U	370 U 370 U	380 U 380 U	380 UJ 380 UJ	360 U	360 U 360 U	370 U 370 U	370 U 370 U	390 U 390 U	370 U 370 U	360 U 360 U	370 U 370 U	380 U 380 U	370 U 370 U
CARBAZOLE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
CHRYSENE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	1,100	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
DIBENZO(A,H)ANTHRACENE DIBENZOFURAN	380 U 380 U	380 U 380 U	380 U 380 U	370 U 370 U	380 R 380 R	400 U 400 U	390 UJ 390 UJ	220 J 390 U	370 U 370 U	380 U 380 U	380 UJ 380 UJ	360 U	360 U 360 U	370 U 370 U	370 U 370 U	390 U 390 U	370 U 370 U	360 U 360 U	370 U 370 U	380 U 380 U	370 U 370 U
DIETHYL PHTHALATE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
DIMETHYL PHTHALATE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
DI-N-BUTYL PHTHALATE DI-N-OCTYL PHTHALATE	380 U 380 U	380 U 380 U	380 U 380 U	370 U 130 J	380 R 380 R	400 U 400 U	390 UJ	390 U 390 U	370 U 370 U	380 U 380 U	380 UJ 610 J	360 U	360 U 360 U	370 U 370 U	370 U 370 U	390 U 390 U	370 U 370 U	360 U 360 U	370 U 370 U	380 U 380 U	370 U 150 J
FLUORANTHENE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	1,800	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
FLUORENE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
HEXACHLOROBENZENE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
HEXACHLOROBUTADIENE HEXACHLOROCYCLOPENTADIENE	380 U 380 U	380 U 380 U	380 U 380 U	370 U 370 U	380 R 380 R	400 U 400 U	390 UJ	390 U 390 U	370 U 370 U	380 U 380 U	380 UJ 380 UJ	360 U	360 U 360 U	370 U 370 U	370 U 370 U	390 U 390 U	370 U 370 U	360 U 360 U	370 U 370 U	380 UJ 380 UJ	370 UJ 370 UJ
HEXACHLOROETHANE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
INDENO(1,2,3-CD)PYRENE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	440	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
ISOPHORONE NAPHTHALENE	380 U	380 U	380 U	370 U	380 R	400 U 400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U 370 U
NAPHTHALENE NITROBENZENE	380 U 380 U	380 U 380 U	380 U 380 U	370 U 370 U	380 R 380 R	400 U	390 UJ	390 U 390 U	370 U 370 U	380 U 380 U	380 UJ 380 UJ	360 U	360 U 360 U	370 U 370 U	370 U 370 U	390 U 390 U	370 U 370 U	360 U 360 U	370 U 370 U	380 U 380 U	370 U
N-NITROSO-DI-N-PROPYLAMINE	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
N-NITROSODIPHENYLAMINE(1)	380 U	380 U	380 U	370 U	380 R	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
PENTACHLOROPHENOL PHENANTHRENE	950 U 380 U	950 U 380 U	950 U 380 U	930 U 370 U	940 U 380 R	1000 U 400 U	980 U 390 UJ	980 U 870	930 U 370 U	940 U 380 U	940 U 380 UJ	910 U 360 U	910 U 360 U	930 U 370 U	930 U 370 U	990 U 390 U	920 U 370 U	910 U 360 U	930 U 370 U	970 U 380 U	930 U 370 U
PHENOL	380 U	380 U	380 U	370 U	380 K	400 U	390 UJ	390 U	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
PYRENE	380 U	380 UJ	380 U	370 U	380 R	400 U	390 UJ	2,000	370 U	380 U	380 UJ	360 U	360 U	370 U	370 U	390 U	370 U	360 U	370 U	380 U	370 U
Destinida (Beharikasia et al. 2)																					
Pesticide/Polychlorinated Biphenyls (UG/KG) 4,4'-DDD	3.8 U	3.8 U	3.8 U	6.2	0.8 J	4.5 J	3.6 J	140	17	3.8 U	3.8 U	3.6 U	3.6 U	1.4 J	3.7 U	3.9 U	3.7 U	3.6 U	3.7 U	2.5 J	3.4 J
4,4'-DDE	3.8 U	0.99 J	2.3 J	4.9	1.2 J	2.2 J	2.8 J	56	5.9 J	0.86 J	3.8 U	3.6 U	3.6 U	120	68	2 J	24 J	6.2	0.86 J	1.8 J	0.89 J
4,4'-DDT	3.8 U	3.8 U	3.8 U	3.7 U	3.8 U	4 U	3.9 U	1.9 J	1.1 J	3.8 U	3.8 U	3.6 U	3.6 U	52 J	41	2 J	20 J	3.3 J	3.7 U	3.8 U	3.7 U
ALDRIN	2 U	2 U	2 U	1.9 U	1.9 U	2 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
ALPHA-BHC ALPHA-CHLORDANE	2 U 2 U	2 U 2 U	2 U 2 U	1.9 U 1.9 U	1.9 U 1.9 U	2 U 2 U	2 U 2 U	2 U 2 U	1.9 U 1.9 U	1.9 U 1.9 U	1.9 U 1.9 U	1.9 U 1.9 U	1.9 U 1.9 U	1.9 U 2.6 J	1.9 U 14 J	2 U 0.88 J	1.9 U 1.9 J	1.9 U 0.56 J	1.9 U 1.9 U	2 U 2 U	1.9 U 1.9 U
AROCLOR-1016	38 U	38 U	38 U	37 U	38 U	40 U	39 U	39 U	37 U	38 U	38 U	36 U	36 U	37 U	37 U	39 U	37 U	36 U	37 U	38 U	37 U
AROCLOR-1221	77 U	77 U	77 U	75 U	76 U	81 U	79 U	79 U	75 U	76 U	76 U	74 U	74 U	75 U	75 U	80 U	74 U	74 U	75 U	78 U	75 U
AROCLOR-1232	38 U	38 U	38 U	37 U	38 U	40 U	39 U	39 U	37 U	38 U	38 U	36 U	36 U	37 U	37 U	39 U	37 U	36 U	37 U	38 U	37 U
AROCLOR-1242 AROCLOR-1248	38 U 38 U	38 U 38 U	38 U 38 U	37 U 37 U	38 U 38 U	40 U 40 U	39 U 39 U	39 U 39 U	37 U 37 U	38 U 38 U	38 U 38 U	36 U	36 U 36 U	37 U 37 U	37 U 37 U	39 U 39 U	37 U 37 U	36 U 36 U	37 U 37 U	38 U 38 U	37 U 37 U
AROCLOR-1254	38 U	38 U	38 U	37 U	38 U	40 U	39 U	39 U	37 U	38 U	38 U	36 U	36 U	37 U	37 U	39 U	37 U	36 U	37 U	38 U	37 U
AROCLOR-1260	38 U	38 U	38 U	37 U	38 U	40 U	39 U	39 U	37 U	38 U	38 U	36 U	36 U	37 U	37 U	39 U	37 U	36 U	37 U	38 U	37 U
BETA-BHC DELTA-BHC	2 U 2 U	0.68 J 2 U	0.6 J 2 U	3 J 1.9 U	1.4 J 1.9 U	0.9 J 2 U	0.97 J 2 U	3.3 J 2 U	3.3 J 1 J	1.7 J 1.9 U	1.9 U 1.9 U	1.9 U 1.9 U	0.8 J 1.9 U	0.61 J 1.9 U	1.9 U 1.9 U	1.1 J 2 U	0.66 J 1.9 U	0.64 J 1.9 U	1.9 U 1.9 U	2 U 2 U	1.9 U 1.9 U
DIELDRIN	3.8 U	3.8 U	3.8 U	3.7 U	3.8 U	4 U	2.6 J	3.9 U	3.7 U	3.8 U	3.8 U	3.6 U	3.6 U	3.7 U	3.7 U	3.9 U	3.7 U	3.6 U	3.7 U	3.8 U	3.7 U
ENDOSULFAN I	2 U	2 U	2 U	1.9 U	1.9 U	2 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
ENDOSULFAN II ENDOSULFAN SULFATE	3.8 U 3.8 U	3.8 U 3.8 U	3.8 U 3.8 U	3.7 U 3.7 U	3.8 U 3.8 U	1.1 J 4 U	3.9 U 3.9 U	3.9 U 3.9 U	3.7 U 3.7 U	3.8 U 3.8 U	3.8 U 3.8 U	3.6 U	3.6 U 3.6 U	3.7 U 3.7 U	3.7 U 3.7 U	3.9 U 3.9 U	3.7 U 3.7 U	3.6 U	3.7 U 3.7 U	3.8 U 3.8 U	3.7 U 3.7 U
ENDOSOLFAN SOLFATE ENDRIN	3.8 U	3.8 U	3.8 U	3.7 U	3.8 U	1 J	3.9 U	3.9 U	3.7 U	3.8 U	3.8 U	3.6 U	3.6 U	3.7 U	3.7 U	3.9 U	3.7 U	3.6 U	3.7 U	3.8 U	3.7 U
ENDRIN ALDEHYDE	3.8 U	3.8 U	3.8 U	3.7 U	3.8 U	4 U	3.9 U	1.2 J	3.7 U	3.8 U	3.8 U	3.6 U	3.6 U	3.7 U	3.7 U	3.9 U	3.7 U	3.6 U	3.7 U	3.8 U	3.7 U
ENDRIN KETONE	3.8 U	3.8 U	3.8 U	2.7 J	3.8 U	4 U	3.9 U	3.9 U	3.7 U	3.8 U	3.8 U	3.6 U	3.6 U	3.7 U	0.96 J	3.9 U	3.7 U	3.6 U	3.7 U	3.8 U	3.7 U
GAMMA-BHC (LINDANE) GAMMA-CHLORDANE	2 U 2 U	2 U 2 U	2 U 2 U	1.9 U 0.74 J	1.9 U 1.9 U	2 U 2 U	2 U 2 U	2 U 2 U	0.4 J 1.9 U	1.9 U 0.49 J	1.9 U 1.9 U	1.9 U 1.9 U	1.9 U 1.9 U	1.9 U 2.1 J	1.9 U 8.2	2 U 0.57 J	1.9 U 0.97 J	1.9 U 1.9 U	1.9 U 1.9 U	2 U 0.45 J	1.9 U 1.9 U
HEPTACHLOR	2 U	2 U	2 U	1.9 U	1.9 U	2 U	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U	1.9 U	1.9 U	2 U	1.9 U
HEPTACHLOR EPOXIDE	2 U	2 U	2 U	0.98 J	1.9 U	0.55 J	2 U	2 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.2 J	2 U	0.65 J	1.9 U	1.9 U	2 U	1.9 U
METHOXYCHLOR TOXAPHENE	20 U 200 U	20 U 200 U	20 U 200 U	19 U 190 U	19 U 190 U	20 U 200 U	20 U 200 U	20 U 200 U	19 U 190 U	19 U 190 U	19 U 190 U	19 U 190 U	19 U 190 U	19 U 190 U	19 U 190 U	20 U 200 U	19 U 190 U	19 U 190 U	19 U 190 U	20 U 200 U	19 U 190 U
I VAAF FIENE	200 0	200 0	200 0	190 U	190 U	200 0	200 0	200 0	190 0	190 U	190 0	190 U	190 0	190 U	190 0	200 0	190 0	190 U	190 0	200 U	190 0
Total Metals (MG/KG)																					
ALUMINUM	2,000	2,260	1,720	1,930	1,670	4,040	3,010	1,710	3,690	2,530	4,350	2,380	2,350	2,510	2,370	3,590	3,350	3,390	1,710	2,230	2,130
ANTIMONY ARSENIC	0.43 U 0.56 U	0.43 U 0.56 U	0.4 U 0.53 U	0.42 U 0.55 U	0.4 U 0.53 U	0.46 U 0.6 U	0.44 U 0.58 U	0.43 U 0.57 U	0.42 U 0.87 J	0.43 U 0.57 U	0.43 U 0.67 J	0.4 U 0.52 U	0.41 U 0.54 U	0.42 U 0.55 J	0.41 U 0.55 U	0.43 U 0.57 U	0.41 U 0.53 U	0.42 U 0.95 J	0.42 U 0.56 U	0.44 U 0.84 U	0.4 U 0.53 U
BARIUM	5.2 J	7.4 J	4.9 J	5.6 J	4.6 J	9.1 J	6.7 J	9.6 J	8.8 J	4.8 J	8.6 J	6.8 J	4.7 J	19.7 J	6.9 J	8 J	10.6 J	9.3 J	6.3 J	5.9 J	6.6 J
BERYLLIUM	0.067 U	0.067 U	0.064 U	0.066 U	0.063 U	0.075 J	0.07 U	0.069 U	0.066 U	0.068 U	0.068 U	0.063 U	0.065 U	0.066 U	0.066 U	0.068 U	0.064 U	0.066 U	0.067 U	0.07 U	0.064 U
CADMIUM CALCIUM	0.09 U 690 J	0.09 U 1,060 J	0.085 U 373 J	0.089 U 2,750 J	0.084 U 343 J	0.097 U 1,190 J	0.093 U 419 J	0.091 U 6,550 J	0.088 J 8,410 J	0.091 U 12,300 J	0.091 U 914 J	0.083 U	0.087 U 820 J	0.088 U	0.087 U	0.09 U 563 J	0.085 U 766 J	0.088 U 429 J	0.089 U	0.093 U 72,000	0.085 U 9,330
CHROMIUM	690 J 2.1 J	1,060 J 2.5	3/3 J 1.6 J	2,750 J 2.3	343 J 1.9 J	1,190 J 4	419 J 3.4	6,550 J 2.6	8,410 J 5.5	12,300 J 3	914 J 3.2	758 J 1.5 J	820 J 1.6 J	2,470 J 2.3	661 J 2.8	563 J 4	766 J 2.8	429 J 3.1	995 J 1.4 J	72,000	9,330
COBALT	0.16 U	0.16 U	0.15 U	0.15 U	0.15 U	0.17 U	0.16 U	0.16 U	0.15 U	0.16 U	0.19 J	0.15 U	0.15 U	0.15 U	0.15 U	0.2 J	0.19 J	0.15 U	0.16 U	0.16 U	0.15 U
COPPER	1.1 J	1.4 J	0.73 J	0.97 J	0.83 J	0.43 J	0.91 J	1.8 J	1.6 J	0.52 J	1.2 J	0.74 J	0.64 J	2 J	2.4 J	3.1 J	1.9 J	0.79 J	0.74 J	0.99 J	0.65 J
IRON LEAD	981 2.8	1,210 4.3	929	1,310 3.4	834 5.3	944	1,930 4.6	1,430 13.7	3,260 10.1	992 2.7	2,260 2.7	977	1,040	1,130 14.8	1,190	1,510 12.7	1,130 9.7	1,830 5.3	667 3.2	2,360 7.2	1,640 2.8
MAGNESIUM	2.8 49.5 J	4.3 56.3 J	2.5 39.4 J	3.4 79.2 J	5.3 45.6 J	4.2 128 J	4.6 97.2 J	13.7 147 J	10.1 230 J	2.7 264 J	2.7 122 J	68.1 J	2 62.2 J	14.8 100 J	29 89.9 J	12.7 94.5 J	9.7 93.3 J	93.2 J	3.2 50.8 J	7.2 1,090 J	2.8 180 J
MANGANESE	3.9 J	5.1 J	2.9 J	4.3 J	3.6 J	4.1 J	4.2 J	9.1 J	8.8 J	10.4 J	4.8 J	6.8 J	4.1 J	8.9 J	8.6 J	5.9 J	4.3 J	3.1 J	4.3 J	14.4	5.7
MERCURY	0.041 U	0.057 U	0.05 U	0.056 U	0.057 U	0.053 U	0.053 U	0.059 U	0.056 U	0.057 U	0.047 U	0.05 U	0.05 U	0.043 U	0.051 U	0.057 U	0.053 U	0.055 U	0.054 U	0.053 U	0.051 U
NICKEL POTASSIUM	0.63 J	0.49 J 35.8 U	1.2 J 27.5 U	0.68 J 35.1 U	0.61 J	0.36 J 62.8 U	0.8 J	0.52 J	0.79 J 177 J	0.37 J	1 J 78.8 J	0.61 J	0.7 J	0.72 J 54.5 U	1.2 J 43.4 U	0.82 J 110 J	0.92 J 59.2 U	0.87 J 60.1 J	0.6 J 33.8 U	0.99 J 88.9 J	0.61 J 38.8 U
SELENIUM SELENIUM	36 U 0.54 UJ	35.8 U 0.54 UJ	27.5 U 0.51 UJ	0.53 UJ	29.5 U 0.51 UJ	0.58 UJ	75.8 U 0.56 UJ	52.3 U 0.55 UJ	0.53 UJ	79.3 J 0.55 UJ	78.8 J 0.54 UJ	44.8 U 0.5 UJ	36 U 0.52 UJ	0.53 UJ	43.4 U 0.52 UJ	0.54 UJ	59.2 U 0.51 UJ	0.53 UJ	0.53 UJ	88.9 J 0.56 UJ	38.8 U 0.51 UJ
SILVER	0.09 U	0.09 U	0.085 U	0.089 U	0.084 U	0.097 U	0.093 U	0.091 U	0.088 U	0.091 U	0.091 U	0.083 U	0.087 U	0.11 U	0.16 U	0.09 U	0.085 U	0.1 U	0.089 U	0.093 U	0.085 U
SODIUM	45.5 U	45.4 U	42.9 U	62.2 J	42.8 U	49 U	47.1 U	46.3 U	69.1 J	46.2 U	45.9 U	42.2 U	43.8 U	44.6 U	44.2 U	45.8 U	43.2 U	44.7 U	45.1 U	161 J	43 U
THALLIUM	0.72 U	0.72 U	0.68 U	0.71 U	0.68 U	0.77 U	0.74 U	0.73 U	0.7 U	0.73 U	0.72 U	0.67 U	0.69 U	0.7 U	0.7 U	0.72 U	0.68 U	0.71 U	0.71 U	0.75 U	0.68 U
VANADIUM ZINC	2 J 4 U	3.1 J 3.2 U	1.8 J 3.1 U	2.7 J 4 U	1.8 J 4.2 U	4.3 J 1.9 U	5.4 J 6.3	3.5 J 5.2	9.1 J 5.9	3.8 J 2.7 U	5.6 J 2.8 U	2.4 J 2.8 U	2.7 J 2.4 U	3.1 J 18.9	4 J 23.2	5.4 J 10.2	4.4 J 5.2	4.6 J 2.7 U	2 J 2.8 U	4.6 J 9.4	3 J 2.9 U
		5.2 0	5.10		7.2 0	1.50	0.0	0.2	5.5	2.7 0	2.0 0	2.0 0	2.7 0	10.3	20.2	10.2	J.2	2.7 0	2.00	J.7	2.5 0

- Notes: J Reported values are estimated U Not detected R Unreliable result

#### Appendix K Groundwater Analytical Results Air Station and Montford Point Site Investigation Preliminary Assessment Sites, CTO-190 MCB Camp Lejeune, North Carolina

Sample ID	IRP1-GW-IS01-6-10	IRP1-GW-IS02-6-10	IRP1-GW-IS03-6-10	IRP1-GW-IS04-6-10	IRP2-GW-IS01-7-11	IPP2 GW IS02 6 10	IRP2-GW-IS03-6-10	IPP2 CW IS04-6-10	IRP3-GW-IS01-6-10	IPP2 GW IS02 6 10	IRP3-GW-IS03-6-10 IRP3	2 CW 1904 6 10 15	PP4 GW IS01 12 16	IDD4 CW IS02 12 16 IDD	4 CW 1902 12 16 IDI	P4 GW IS04 14 18	IRP5-GW-IS01-16-20	IDD5 GW IS02-16-20	IPPE CW 1902-16-20	IRP5-GW-IS03-16-20-DUP	D IDDS GW ISO4 15 1
Sample Date	6/7/04	6/7/04	6/11/04	6/11/04	6/7/04	6/7/04	6/11/04	6/11/04	6/9/04	6/9/04	6/10/04	6/11/04	6/9/04	6/9/04	6/10/04	6/10/04	6/9/04	6/9/04	6/10/04	6/10/04	6/10/04
Chemical Name																					
Volatile Organic Compounds (UG/L)																					+
1,1,1-TRICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
1,1,2,2-TETRACHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE 1,1,2-TRICHLOROETHANE	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-DICHLOROETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
1,1-DICHLOROETHENE 1,2,4-TRICHLOROBENZENE	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U
1,2-DIBROMO-3-CHLOROPROPANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
1,2-DIBROMOETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
1,2-DICHLOROBENZENE 1,2-DICHLOROETHANE	10 U 10 U	10 U 10 U	10 U 10 UJ	10 U 10 UJ	10 U 10 U	10 U 10 U	10 U 10 UJ	10 U 10 UJ	10 U 10 U	10 U 10 U	10 U 10 UJ	10 U	10 U	10 U	10 U 10 UJ	10 U	10 U	10 U 10 U	10 U	10 U 10 UJ	10 U
1,2-DICHLOROPROPANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
1,3-DICHLOROBENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
1,4-DICHLOROBENZENE 2-BUTANONE	10 U 10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U
2-HEXANONE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
4-METHYL-2-PENTANONE ACETONE	10 U 10 UJ	10 U 10 UJ	10 UJ 10 U	10 UJ	10 U 10 UJ	10 U 10 UJ	10 UJ 10 U	10 UJ 10 U	10 U 10 U	10 U	10 UJ 10 U	10 U	10 U	10 U	10 UJ 10 U	10 U 10 UJ	10 U	10 U	10 U	10 UJ 10 U	10 U.
BENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
BROMODICHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
BROMOFORM BROMOMETHANE	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U
CARBON DISULFIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
CARBON TETRACHLORIDE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U											
CHLOROBENZENE CHLOROETHANE	10 U 10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U
CHLOROFORM	10 U	2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U									
CHLOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U											
CIS-1,2-DICHLOROETHENE CIS-1,3-DICHLOROPROPENE	10 U 10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U
CYCLOHEXANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
DIBROMOCHLOROMETHANE DICHLORODIFLUOROMETHANE	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
ETHYLBENZENE	10 U	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U											
ISOPROPYLBENZENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
METHYL ACETATE METHYLCYCLOHEXANE	10 U 10 U	10 U 10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U
METHYLENE CHLORIDE	10 U	2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U							
METHYL-T-BUTYL ETHER STYRENE	10 U	16	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U								
TETRACHLOROETHENE	10 U 10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U
TOLUENE	10 U	0.8 J	10 U	10 U	10 U	1 J	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U					
TRANS-1,2-DICHLOROETHENE TRANS-1,3-DICHLOROPROPENE	10 U 10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U
TRICHLOROETHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
TRICHLOROFLUOROMETHANE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
VINYL CHLORIDE XYLENE (TOTAL)	10 U 10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U 7 J	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U 15	10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U
Semivolatile Organic Compounds (UG/L)  1,1'-BIPHENYL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
2,2'-OXYBIS(1-CHLOROPROPANE)	10 UJ	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U							
2,4,5-TRICHLOROPHENOL 2.4.6-TRICHLOROPHENOL	25 U 10 U	26 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U						
2,4-DICHLOROPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U											
2,4-DIMETHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U											
2,4-DINITROPHENOL 2,4-DINITROTOLUENE	25 R 10 U	25 R 10 U	25 UJ 10 U	25 UJ 10 U	25 R 10 U	25 R 10 U	25 UJ 10 U	26 U 10 U	25 R 10 U	25 R 10 U	25 U 10 U	25 R 10 U	25 R 10 U	25 R 10 U	25 R 10 U	25 UJ 10 U	25 R 10 U	25 R 10 U	25 R 10 U	25 R 10 U	25 R 10 U
2,6-DINITROTOLUENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
2-CHLORONAPHTHALENE 2-CHLOROPHENOL	10 U 10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U
2-METHYLNAPHTHALENE	10 U	10 U	10 UJ		10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ		10 U	10 U	10 U	10 U
2-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
2-NITROANILINE 2-NITROPHENOL	25 U 10 U	26 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U						
3,3'-DICHLOROBENZIDINE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
3-NITROANILINE 4,6-DINITRO-2-METHYLPHENOL	25 U 25 UJ	26 U 26 U	25 U 25 UJ	25 U 25 UJ	25 U 25 U	25 U 25 UJ	25 U 25 UJ	25 U 25 UJ	25 U 25 UJ	25 U 25 UJ	25 U 25 UJ	25 U 25 UJ	25 U 25 UJ	25 U 25 UJ	25 U						
4,6-DINITRO-2-METHYLPHENOL 4-BROMOPHENYL PHENYL ETHER	10 U	10 U	25 UJ 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	25 UJ 10 U	10 U
4-CHLORO-3-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U											
4-CHLOROANILINE 4-CHLOROPHENYL PHENYL ETHER	10 U 10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U 10 UJ	10 U 10 UJ	10 U 10 U	10 U 10 UJ	10 U 10 UJ	10 U 10 UJ	10 U 10 UJ	10 U	10 U 10 UJ	10 U 10 UJ	10 U 10 UJ	10 U 10 UJ	10 U
4-METHYLPHENOL	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
4-NITROANILINE	25 U	25 U	25 U		25 U	25 U	25 U	26 U	25 UJ	25 UJ	25 U	25 UJ	25 UJ	25 UJ	25 UJ	25 U	25 UJ	25 UJ	25 UJ	25 UJ	
4-NITROPHENOL ACENAPHTHENE	25 U 10 U	25 U 10 U	25 UJ 10 U	25 UJ 10 U	25 U 10 U	25 U 10 U	25 UJ 10 U	26 UJ 10 U	25 U 10 U	25 U 10 U	25 UJ 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 UJ 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U	25 U 10 U
ACENAPHTHYLENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U										
ACETOPHENONE ANTHRACENE	10 U 10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U
ATRAZINE	10 U	10 U	10 U		10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U							
BENZALDEHYDE	10 UJ	10 UJ	10 UJ		10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 UJ		10 U	10 U	10 U	10 U
BENZO(A)ANTHRACENE BENZO(A)PYRENE	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	
BENZO(B)FLUORANTHENE	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U											
BENZO(G,H,I)PERYLENE	10 U	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 UJ	10 UJ	10 UJ	10 UJ								
BENZO(K)FLUORANTHENE BIS(2-CHLOROETHOXY)METHANE	10 U 10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U
BIS(2-CHLOROETHYL)ETHER	10 U	10 U	10 UJ		10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ		10 U	10 U	10 U	

## Appendix K Groundwater Analytical Results Air Station and Montford Point Site Investigation Preliminary Assessment Sites, CTO-190 MCB Camp Lejeune, North Carolina

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Column	4,4'-DDE																					0.1 U
PARTISON   190	4,4'-DDT																					0.1 U
PROMORPHISM   1997   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   1207   12																						0.05 U 0.05 U
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RECOMMENDAMEN 19 10 10 10 10 10 10 10 10 10 10 10 10 10	AROCLOR-1248	1 U	1 U	1 U	1 U	1 U	1 U		1 U	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U		1 U	1 U	1 U	1 U	1 U
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HERMS 6.19 6.19 6.10 6.10 6.10 6.10 6.10 6.10 6.10 6.10	BETA-BHC																					1 U 0.05 U
Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Company   Comp	DELTA-BHC	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 UJ	0.05 U	0.014 J	0.05 U	0.05 U	0.01 J	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
NORMANN   10   10   10   10   10   10   10	DIELDRIN																					0.1 U
NORTH   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP   STOP																						0.05 U 0.1 U
PRINTALE PRINTED   10	ENDOSULFAN SULFATE																					0.1 U
NERNAMENDE 9:10 5:10 5:10 5:10 5:10 5:10 5:10 5:10 5	ENDRIN																					0.1 U
MARIAGE CREAMY   0.681																						0.1 U 0.1 U
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EMONYCHOR SU SU SU SU SU SU SU SU SU SU SU SU SU	HEPTACHLOR																					0.05 U
SOMEWINDERS   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.U   S.	METHOXYCHLOR																					0.5 U
MANNAM   S.300   S.300   S.500   S.5	TOXAPHENE		5 U		5 U	5 U				5 UJ			5 U		5 U				5 U		5 U	5 U
MANNAM   S.300   S.300   S.500   S.5	Total Metals (UG/L)	-			+																	<del> </del>
NTMOWY 2.1 0 3.1 0 2.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1	ALUMINUM	8,320 J	8,130 J	45,000	3,000	25,100 J	242,000 J	30,100	19,300	102,000 J	2,520 J	558	5,350 J	8,750 J	935 J	1,010 J	5,530	1,870 J	26,600 J	583 J	511 J	1,630 J
ARUM 933 J 68.1 J 181 J 952 J 82.6 488 129 J 117 J 390 185 J 152 J 88.2 J 97.5 J 51.4 92.8 J 169 J 61.2 J 92.7 J 94.2 J 78.1 FEVALUM 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J 0.4 J	ANTIMONY		3.1 U		2.6 U	4.6 U	5.6 U				4.6 U	1.9 U	2.4 U	1.9 U			3.2 U	2 U	2.1 U			2.6 U
EPYCLIM  0.48 J  0.50 J  1.1 J  0.50 U  1.4 J  0.50 U  1.5 J  0.6 U  0.4 U  0.4 U  0.4 U  0.4 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5 U  0.5	ARSENIC BARIUM																					7.3 J 78.1 J
ADMIM O 0.4 U 0.4 U 0.4 U 0.4 U 1.1 J 1.3 U 0.4 U 0.4 U 0.8 J 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4 U 0.4	BERYLLIUM																					78.1 J 0.3 U
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ANADIUM 17 J 22.9 J 71.3 8.4 J 47.4 J 287 53.6 37 J 143 6.2 J 2.2 J 13 J 12.4 J 0.91 J 0.4 U 3 J 4.2 J 26.7 J 0.4 U 0.4 U 2.5	SODIUM	6,330		14,100	8,870	14,500	14,000	5,300	8,640					8,320	23,600	8,740		6,990		6,090	6,050	5,740
	THALLIUM																					3.2 U 2.5 J
	VANADIUM ZINC	17 J 176	22.9 J 56.8	71.3 834	8.4 J 361	47.4 J 137	287	53.6 98.8	37 J 137	143 267	6.2 J 297	2.2 J 246	13 J 54.6	12.4 J 322	0.91 J 103	0.4 U 237	3 J 236	4.2 J 124	26.7 J 84.5	0.4 U 105	0.4 U 117	2.5 J 238

- J Reported values are estimated R Unreliable result
- U Not detected

# Appendix K QC Analytical Results Air Station and Montford Point Sites Preliminary Assessment Sites, CTO-190 MCB Camp Lejeune, NC

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Sample ID	IRPA-WT-EB01	IRPA-WT-EB02	IRPA-WT-TB01	IRPA-WT-TB02	IRPA-WT-TB03	IRPA-WT-TB04	IRPA-WT-TB06	IRPA-WT-TB07
Sample Date	6/11/04	6/11/04	6/7/04	6/7/04	6/9/04	6/9/04	6/11/04	6/11/04
Chemical Name	1							
Volatile Organic Compounds (UG/L)	1							
1,1,1-TRICHLOROETHANE	10 U							
1,1,2,2-TETRACHLOROETHANE	10 U							
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE 1,1,2-TRICHLOROETHANE	10 U 10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U 10 U
1,1-DICHLOROETHANE	10 U							
1,1-DICHLOROETHENE	10 U							
1,2,4-TRICHLOROBENZENE	10 U							
1,2-DIBROMO-3-CHLOROPROPANE	10 U							
1,2-DIBROMOETHANE 1,2-DICHLOROBENZENE	10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U	10 U	10 U
1,2-DICHLOROETHANE	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 UJ	10 U
1,2-DICHLOROPROPANE	10 U							
1,3-DICHLOROBENZENE	10 U							
1,4-DICHLOROBENZENE 2-BUTANONE	10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U	10 U	10 U
2-BUTANONE 2-HEXANONE	10 U							
4-METHYL-2-PENTANONE	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 UJ	10 U
ACETONE	10 U	10 U	10 UJ	10 UJ	10 U	10 U	10 U	10 U
BENZENE	10 U							
BROMODICHLOROMETHANE BROMOGORM	10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U	10 U
BROMOFORM BROMOMETHANE	10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U	10 U	10 U
CARBON DISULFIDE	10 U							
CARBON TETRACHLORIDE	10 U							
CHLOROBENZENE	10 U							
CHLOROETHANE CHLOROFORM	10 U 10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U 10 U	10 U
CHLOROMETHANE	10 U							
CIS-1,2-DICHLOROETHENE	10 U							
CIS-1,3-DICHLOROPROPENE	10 U							
CYCLOHEXANE	10 U							
DIBROMOCHLOROMETHANE DICHLORODIFLUOROMETHANE	10 U 10 U	10 U 10 U	10 U	10 U	10 U	10 U	10 U 10 U	10 U
ETHYLBENZENE	10 U							
ISOPROPYLBENZENE	10 U							
METHYL ACETATE	10 U							
METHYLCYCLOHEXANE	10 U							
METHYLENE CHLORIDE METHYL-T-BUTYL ETHER	10 U 10 U	10 U 10 U	10 U 10 U	10 U	10 U 10 U	10 U	10 U	10 U
STYRENE	10 U							
TETRACHLOROETHENE	10 U							
TOLUENE	10 U							
TRANS-1,2-DICHLOROETHENE TRANS-1,3-DICHLOROPROPENE	10 U	10 U 10 U	10 U	10 U	10 U 10 U	10 U	10 U	10 U
TRICHLOROETHENE	10 U							
TRICHLOROFLUOROMETHANE	10 U							
VINYL CHLORIDE	10 U							
XYLENE (TOTAL)	10 U							
Semivolatile Organic Compounds (UG/L)	-							
1,1'-BIPHENYL	10 U	10 U	NA	NA	NA	NA	NA	NA
2,2'-OXYBIS(1-CHLOROPROPANE)	10 UJ	10 UJ	NA	NA	NA	NA	NA	NA
2,4,5-TRICHLOROPHENOL	25 U	25 U	NA	NA	NA	NA	NA	NA
2,4,6-TRICHLOROPHENOL	10 U	10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
2,4-DICHLOROPHENOL 2,4-DIMETHYLPHENOL	10 U	10 U 10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
2,4-DINITROPHENOL	25 UJ	25 UJ	NA NA					
2,4-DINITROTOLUENE	10 U	10 U	NA	NA	NA	NA	NA	NA
2,6-DINITROTOLUENE	10 U	10 U	NA	NA	NA	NA	NA	NA
2-CHLORONAPHTHALENE 2-CHLOROPHENOL	10 U 10 U	10 U 10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
2-METHYLNAPHTHALENE	10 UJ	10 UJ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
2-METHYLPHENOL	10 U	10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
2-NITROANILINE	25 U	25 U	NA	NA	NA	NA	NA	NA
2-NITROPHENOL	10 U	10 U	NA	NA NA	NA NA	NA NA	NA NA	NA NA
3,3'-DICHLOROBENZIDINE 3-NITROANILINE	10 U 25 U	10 U 25 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
4,6-DINITRO-2-METHYLPHENOL	25 UJ	25 UJ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
4-BROMOPHENYL PHENYL ETHER	10 U	10 U	NA NA					
4-CHLORO-3-METHYLPHENOL	10 U	10 U	NA	NA	NA	NA	NA	NA
4-CHLOROANILINE	10 U	10 U	NA	NA	NA	NA	NA	NA
4-CHLOROPHENYL PHENYL ETHER 4-METHYLPHENOL	10 U	10 U 10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
4-METHYLPHENOL 4-NITROANILINE	10 U 25 U	10 U 25 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
4-NITROPHENOL	25 UJ	25 UJ	NA NA	NA NA				
	1 20 00	20 00	14/3	I 1973	INA	14/1	1473	11/1

### Appendix K QC Analytical Results Air Station and Montford Point Sites Preliminary Assessment Sites, CTO-190 MCB Camp Lejeune, NC

Comple ID	IDDA WT FD04	IDDA WT FD02	IDDA WIT TOO	IRPA-WT-TB02	IRPA-WT-TB03	IDDA WT TD04	IRPA-WT-TB06	IRPA-WT-TB07
Sample ID Sample Date	IRPA-WT-EB01 6/11/04	IRPA-WT-EB02 6/11/04	IRPA-WT-TB01 6/7/04	6/7/04	6/9/04	IRPA-WT-TB04 6/9/04	6/11/04	6/11/04
Chemical Name	0/11/04	0/11/04	0/1/04	3/1/04	0/3/04	0/3/04	0/11/04	0/11/04
Chemical Name								
ACENAPHTHENE	10 U	10 U	NA	NA	NA	NA	NA	NA
ACENAPHTHYLENE	10 U	10 U	NA	NA	NA	NA	NA	NA
ACETOPHENONE	10 U	10 U	NA	NA NA	NA	NA	NA NA	NA NA
ANTHRACENE ATRAZINE	10 U 10 U	10 U 10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
BENZALDEHYDE	10 UJ	10 UJ	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
BENZO(A)ANTHRACENE	10 U	10 U	NA	NA	NA	NA	NA	NA
BENZO(A)PYRENE	10 U	10 U	NA	NA	NA	NA	NA	NA
BENZO(B)FLUORANTHENE	10 U	10 U	NA	NA	NA	NA	NA	NA
BENZO(G,H,I)PERYLENE	10 U 10 U	10 U 10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
BENZO(K)FLUORANTHENE BIS(2-CHLOROETHOXY)METHANE	10 U	10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
BIS(2-CHLOROETHYL)ETHER	10 UJ	10 UJ	NA NA	NA NA				
BIS(2-ETHYLHEXYL)PHTHALATE	10 U	10 U	NA	NA	NA	NA	NA	NA
BUTYL BENZYL PHTHALATE	10 U	10 U	NA	NA	NA	NA	NA	NA
CAPROLACTAM	10 U	10 U	NA	NA	NA	NA	NA	NA
CARBAZOLE	10 U	10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
CHRYSENE DIBENZO(A,H)ANTHRACENE	10 U	10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
DIBENZOFURAN	10 U	10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
DIETHYL PHTHALATE	10 U	10 U	NA	NA	NA	NA	NA	NA
DIMETHYL PHTHALATE	10 U	10 U	NA	NA	NA	NA	NA	NA
DI-N-BUTYL PHTHALATE	10 U	10 U	NA	NA	NA	NA	NA	NA
DI-N-OCTYL PHTHALATE	10 U	10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
FLUORANTHENE FLUORENE	10 U 10 U	10 U 10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
HEXACHLOROBENZENE	10 U	10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
HEXACHLOROBUTADIENE	10 UJ	10 UJ	NA	NA	NA	NA	NA	NA
HEXACHLOROCYCLOPENTADIENE	10 UJ	10 UJ	NA	NA	NA	NA	NA	NA
HEXACHLOROETHANE	10 U	10 U	NA	NA	NA	NA	NA	NA
INDENO(1,2,3-CD)PYRENE	10 U	10 U	NA	NA	NA	NA	NA	NA NA
ISOPHORONE NAPHTHALENE	10 U 10 U	10 U 10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
NITROBENZENE	10 U	10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
N-NITROSO-DI-N-PROPYLAMINE	10 U	10 U	NA NA					
N-NITROSODIPHENYLAMINE(1)	10 U	10 U	NA	NA	NA	NA	NA	NA
PENTACHLOROPHENOL	25 U	25 U	NA	NA	NA	NA	NA	NA
PHENANTHRENE	10 U	10 U	NA	NA	NA	NA	NA	NA
PHENOL PYRENE	10 U 10 U	10 U 10 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
FIRENE	10 0	10 0	INA	NA NA	INA	INA	INA	INA
Pesticide/Polychlorinated Biphenyls (UG/L)								
4,4'-DDD	0.1 U	0.1 U	NA	NA	NA	NA	NA	NA
4,4'-DDE	0.1 U	0.1 U	NA	NA	NA	NA	NA	NA
4,4'-DDT	0.1 U	0.1 U	NA	NA	NA	NA	NA	NA 
ALDRIN ALPHA-BHC	0.05 U 0.05 U	0.05 U 0.05 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
ALPHA-CHLORDANE	0.05 U	0.05 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
AROCLOR-1016	1 U	1 U	NA	NA	NA	NA	NA	NA
AROCLOR-1221	2 U	2 U	NA	NA	NA	NA	NA	NA
AROCLOR-1232	1 U	1 U	NA	NA	NA	NA	NA	NA
AROCLOR-1242	1 U	1 U	NA	NA NA	NA	NA	NA	NA NA
AROCLOR-1248 AROCLOR-1254	1 U 1 U	1 U 1 U	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA
AROCLOR-1260						INA	INA	INA
	1 U	1 U	NA NA	NA NA	NA NA		NA	NA
BETA-BHC				NA NA NA		NA NA	NA NA	NA NA
BETA-BHC DELTA-BHC	1 U 0.05 U 0.05 U	1 U 0.05 U 0.05 U	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA	NA NA
BETA-BHC DELTA-BHC DIELDRIN	1 U 0.05 U 0.05 U 0.1 U	1 U 0.05 U 0.05 U 0.1 U	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA NA
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I	1 U 0.05 U 0.05 U 0.1 U 0.05 U	1 U 0.05 U 0.05 U 0.1 U 0.05 U	NA NA NA NA	NA NA NA NA	NA NA NA NA	NA NA NA NA	NA NA NA	NA NA NA
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I ENDOSULFAN II	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U	NA NA NA NA NA	NA NA NA NA NA	NA NA NA NA NA	NA NA NA NA NA	NA NA NA NA	NA NA NA NA
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U	NA NA NA NA	NA NA NA NA	NA NA NA NA	NA NA NA NA	NA NA NA	NA NA NA
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U	NA NA NA NA NA NA NA NA NA	NA NA NA NA NA NA NA NA NA NA	NA NA NA NA NA NA	NA NA NA NA NA NA	NA NA NA NA NA	NA NA NA NA NA
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE ENDRIN ENDRIN ENDRIN ALDEHYDE ENDRIN KETONE	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA	NA NA NA NA NA NA NA NA NA NA NA NA NA N
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE ENDRIN ENDRIN ENDRIN ALDEHYDE ENDRIN KETONE GAMMA-BHC (LINDANE)	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.01 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE ENDRIN ENDRIN ENDRIN ALDEHYDE ENDRIN KETONE GAMMA-BHC (LINDANE) GAMMA-CHLORDANE	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE ENDRIN ENDRIN ENDRIN ALDEHYDE ENDRIN KETONE GAMMA-BHC (LINDANE) HEPTACHLOR	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.05 U	1 U 0.05 U 0.05 U 0.01 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.05 U	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE ENDRIN ENDRIN ALDEHYDE ENDRIN ALDEHYDE ENDRIN KETONE GAMMA-BHC (LINDANE) GAMMA-CHLORDANE HEPTACHLOR	1 U 0.05 U 0.05 U 0.11 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.05 U 0.05 U 0.05 U	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE ENDRIN ENDRIN ENDRIN ALDEHYDE ENDRIN KETONE GAMMA-BHC (LINDANE) HEPTACHLOR	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.05 U	1 U 0.05 U 0.05 U 0.11 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.05 U 0.05 U	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE ENDRIN ENDRIN ENDRIN ALDEHYDE ENDRIN KETONE GAMMA-BHC (LINDANE) GAMMA-CHLORDANE HEPTACHLOR HEPTACHLOR METHOXYCHLOR TOXAPHENE	1 U 0.05 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.05 U 0.05 U 0.05 U 0.05 U 0.05 U	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.5 U 0.05 U 0.05 U 0.05 U 0.05 U 0.05 U	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N
BETA-BHC  DELTA-BHC  DIELDRIN  ENDOSULFAN I  ENDOSULFAN SULFATE  ENDRIN  ENDRIN ALDEHYDE  ENDRIN KETONE  GAMMA-BHC (LINDANE)  GAMMA-CHLORDANE  HEPTACHLOR  HEPTACHLOR  TOXAPHENE  Total Metals (UG/L)	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.5 U 0.05 U 0.05 U 0.05 U 5 U	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N
BETA-BHC DELTA-BHC DIELDRIN ENDOSULFAN I ENDOSULFAN II ENDOSULFAN SULFATE ENDRIN ENDRIN ALDEHYDE ENDRIN KETONE GAMMA-BHC (LINDANE) HEPTACHLOR EPOXIDE METHOXYCHLOR TOXAPHENE  Total Metals (UG/L) ALUMINUM	1 U 0.05 U 0.05 U 0.01 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.5 U 0.05 U 0.05 U 0.05 U 0.05 U 0.7 U 0.8 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U 0.9 U	1 U 0.05 U 0.05 U 0.01 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.05 U 0.05 U 0.05 U 0.05 U 0.05 U 0.7 U 0.7 U 0.7 U 0.7 U 0.7 U 0.7 U	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N
BETA-BHC  DELTA-BHC  DIELDRIN  ENDOSULFAN I  ENDOSULFAN SULFATE  ENDRIN  ENDRIN ALDEHYDE  ENDRIN KETONE  GAMMA-BHC (LINDANE)  GAMMA-CHLORDANE  HEPTACHLOR  HEPTACHLOR  TOXAPHENE  Total Metals (UG/L)	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.5 U 0.05 U 0.05 U 0.05 U 5 U	1 U 0.05 U 0.05 U 0.1 U 0.05 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U 0.1 U	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N	NA NA NA NA NA NA NA NA NA NA NA NA NA N

### Appendix K QC Analytical Results Air Station and Montford Point Sites Preliminary Assessment Sites, CTO-190 MCB Camp Lejeune, NC

Sample ID	IRPA-WT-EB01	IRPA-WT-EB02	IRPA-WT-TB01	IRPA-WT-TB02	IRPA-WT-TB03	IRPA-WT-TB04	IRPA-WT-TB06	IRPA-WT-TB07
Sample Date	6/11/04	6/11/04	6/7/04	6/7/04	6/9/04	6/9/04	6/11/04	6/11/04
Chemical Name								
BERYLLIUM	0.3 U	0.3 U	NA	NA	NA	NA	NA	NA
CADMIUM	0.4 U	0.4 U	NA	NA	NA	NA	NA	NA
CALCIUM	15.3 U	15.3 U	NA	NA	NA	NA	NA	NA
CHROMIUM	0.8 U	0.8 U	NA	NA	NA	NA	NA	NA
COBALT	0.7 U	0.7 U	NA	NA	NA	NA	NA	NA
COPPER	1.3 U	1.3 U	NA	NA	NA	NA	NA	NA
IRON	29.1 U	29.1 U	NA	NA	NA	NA	NA	NA
LEAD	1.3 U	1.3 U	NA	NA	NA	NA	NA	NA
MAGNESIUM	11.8 U	11.8 U	NA	NA	NA	NA	NA	NA
MANGANESE	0.24 U	0.1 U	NA	NA	NA	NA	NA	NA
MERCURY	0.1 U	0.1 U	NA	NA	NA	NA	NA	NA
NICKEL	0.7 U	0.7 U	NA	NA	NA	NA	NA	NA
POTASSIUM	53.7 J	24.1 U	NA	NA	NA	NA	NA	NA
SELENIUM	2.4 UJ	2.4 UJ	NA	NA	NA	NA	NA	NA
SILVER	0.4 U	0.4 U	NA	NA	NA	NA	NA	NA
SODIUM	202 U	202 U	NA	NA	NA	NA	NA	NA
THALLIUM	3.2 U	3.2 U	NA	NA	NA	NA	NA	NA
VANADIUM	0.4 U	0.4 U	NA	NA	NA	NA	NA	NA
ZINC	3.8 U	3.7 U	NA	NA	NA	NA	NA	NA

#### Notes:

NA - Not analyzed

J - Reported values are estimated
U - Not detected

APPENDIX L
BACKGROUND COMPARISON TESTS AND SCATTER
PLOTS FOR AIR STATION AND MONTFORD POINT
INORGANIC SURFACE SOIL DATA

### **Building SAS113 Comparison to Background**

	Probability that the Observed	Is Background	Bkgd	CTO 190	Number of	Number of
	Differences Would Occur	Exceeded via	Detection	Detection	Detects >	NDs >
Parameter	Purely by Chance	WRS Test?	Frequency	Frequency	BTV *	BTV *
Aluminum	0.507	no	49/49	4/4	0	0
Antimony	No Site Detec	ts	19/49	0/4	0	0
Arsenic	No Site Detec	ts	17/49	0/4	0	0
Barium	0.420	no	46/49	4/4	0	0
Beryllium	No Site Detec	ts	31/49	0/4	0	0
Cadmium	No Site Detec	ts	5/49	0/4	0	0
Calcium	0.005	Yes	42/49	4/4	1	0
Chromium	0.285	no	44/49	4/4	0	0
Cobalt	No Site Detec	ts	27/49	0/4	0	0
Copper	0.553	no	39/49	4/4	0	0
Iron	0.171	no	49/49	4/4	0	0
Lead	0.599	no	49/49	4/4	0	0
Magnesium	0.106	no	43/49	4/4	1	0
Manganese	0.202	no	44/49	4/4	0	0
Mercury	No Site Detec	ts	24/49	0/4	0	0
Nickel	0.211	no	37/49	4/4	0	0
Potassium	0.759	no	41/49	1/4	0	0
Selenium	No Site Detec	ts	16/49	0/4	0	0
Silver	No Site Detec	ts	4/49	0/4	0	0
Sodium	0.803	no	1/49	1/4	No BTV	No BTV
Thallium	No Site Detec	ts	0/49	0/4	No BTV	No BTV
Vanadium	0.473	no	48/49	4/4	0	0
Zinc	0.427	no	34/49	1/4	0	0

### **Building AS116 Comparison to Background**

					1	
	Probability that the Observed Differences Would	Is Background Exceeded via	Bkgd Detection	CTO 190 Detection	Number of Detects >	Number of NDs >
Parameter	Occur Purely by Chance	WRS Test?	Frequency	Frequency	BTV *	BTV *
Aluminum	0.493	no	49/49	4/4	0	0
Antimony	No Site Detec	ts	19/49	0/4	0	0
Arsenic	No Site Detec	ts	17/49	0/4	0	0
Barium	0.507	no	46/49	4/4	0	0
Beryllium	0.440	no	31/49	1/4	0	0
Cadmium	No Site Detec	ts	5/49	0/4	0	0
Calcium	0.023	Yes	42/49	4/4	0	0
Chromium	0.453	no	44/49	4/4	0	0
Cobalt	No Site Detec	ts	27/49	0/4	0	0
Copper	0.864	no	39/49	4/4	0	0
Iron	0.440	no	49/49	4/4	0	0
Lead	0.644	no	49/49	4/4	0	0
Magnesium	0.427	no	43/49	4/4	0	0
Manganese	0.618	no	44/49	4/4	0	0
Mercury	No Site Detec	ts	24/49	0/4	0	0
Nickel	0.241	no	37/49	4/4	0	0
Potassium	No Site Detec	ts	41/49	0/4	0	0
Selenium	No Site Detec	ts	16/49	0/4	0	0
Silver	No Site Detec	ts	4/49	0/4	0	0
Sodium	0.803	no	1/49	1/4	No BTV	No BTV
Thallium	No Site Detec	ts	0/49	0/4	No BTV	No BTV
Vanadium	0.606	no	48/49	4/4	0	0
Zinc	No Site Detec	ts	34/49	0/4	0	0

### **Building AS119 Comparison to Background**

Probability that the Observed Differences Would Occur Purely by Chance							
Parameter         Occur Purely by Chance         WRS Test?         Frequency         Frequency         BTV *         BTV *           Aluminum         0.226         no         49/49         4/4         0         0           Antimony         No Site Detects         19/49         0/4         0         0           Arsenic         0.068         no         17/49         1/4         0         0           Barium         0.263         no         46/49         4/4         0         0           Beryllium         No Site Detects         31/49         0/4         0         0           Cadmium         0.002         Yes         5/49         1/4         1         0           Calcium         0.006         Yes         42/49         4/4         0         0           Chromium         0.125         no         44/49         4/4         0         0           Cobalt         No Site Detects         27/49         0/4         0         0           Copper         0.369         no         39/49         4/4         0         0           Iron         0.106         no         49/49         4/4         0         0				_			
Aluminum         0.226         no         49/49         4/4         0         0           Antimony         No Site Detects         19/49         0/4         0         0           Arsenic         0.068         no         17/49         1/4         0         0           Barium         0.263         no         46/49         4/4         0         0           Beryllium         No Site Detects         31/49         0/4         0         0           Cadmium         0.002         Yes         5/49         1/4         1         0           Calcium         0.006         Yes         42/49         4/4         0         0           Chromium         0.125         no         44/49         4/4         0         0           Copatt         No Site Detects         27/49         0/4         0         0           Copper         0.369         no         39/49         4/4         0         0           Iron         0.106         no         49/49         4/4         0         0           Magnesium         0.025         Yes         43/49         4/4         0         0           Marguey         <	Parameter						
Arsenic         0.068         no         17/49         1/4         0         0           Barium         0.263         no         46/49         4/4         0         0           Beryllium         No Site Detects         31/49         0/4         0         0           Cadmium         0.002         Yes         5/49         1/4         1         0           Calcium         0.006         Yes         42/49         4/4         0         0           Chromium         0.125         no         44/49         4/4         0         0           Chromium         0.125         no         44/49         4/4         0         0           Cobalt         No Site Detects         27/49         0/4         0         0           Copper         0.369         no         39/49         4/4         0         0           Iron         0.106         no         49/49         4/4         0         0           Lead         0.143         no         49/49         4/4         0         0           Magnesium         0.025         Yes         43/49         4/4         0         0           Mercury	Aluminum		no			0	0
Barium         0.263         no         46/49         4/4         0         0           Beryllium         No Site Detects         31/49         0/4         0         0           Cadmium         0.002         Yes         5/49         1/4         1         0           Calcium         0.006         Yes         42/49         4/4         0         0           Chromium         0.125         no         44/49         4/4         0         0           Chromium         0.125         no         44/49         4/4         0         0           Cobalt         No Site Detects         27/49         0/4         0         0           Copper         0.369         no         39/49         4/4         0         0           Iron         0.106         no         49/49         4/4         0         0           Lead         0.143         no         49/49         4/4         0         0           Magnesium         0.025         Yes         43/49         4/4         0         0           Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.	Antimony	No Site Detec	ets	19/49	0/4	0	0
Beryllium         No Site Detects         31/49         0/4         0         0           Cadmium         0.002         Yes         5/49         1/4         1         0           Calcium         0.006         Yes         42/49         4/4         0         0           Chromium         0.125         no         44/49         4/4         0         0           Cobalt         No Site Detects         27/49         0/4         0         0           Copper         0.369         no         39/49         4/4         0         0           Iron         0.106         no         49/49         4/4         0         0           Lead         0.143         no         49/49         4/4         0         0           Magnesium         0.025         Yes         43/49         4/4         0         0           Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         2/4         0         0           Selenium <td< td=""><td>Arsenic</td><td>0.068</td><td>no</td><td>17/49</td><td>1/4</td><td>0</td><td>0</td></td<>	Arsenic	0.068	no	17/49	1/4	0	0
Cadmium         0.002         Yes         5/49         1/4         1         0           Calcium         0.006         Yes         42/49         4/4         0         0           Chromium         0.125         no         44/49         4/4         0         0           Cobalt         No Site Detects         27/49         0/4         0         0           Copper         0.369         no         39/49         4/4         0         0           Iron         0.106         no         49/49         4/4         0         0           Lead         0.143         no         49/49         4/4         0         0           Magnesium         0.025         Yes         43/49         4/4         0         0           Manganese         0.070         no         44/49         4/4         0         0           Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         0/4         0         0           Selenium	Barium	0.263	no	46/49	4/4	0	0
Calcium         0.006         Yes         42/49         4/4         0         0           Chromium         0.125         no         44/49         4/4         0         0           Cobalt         No Site Detects         27/49         0/4         0         0           Copper         0.369         no         39/49         4/4         0         0           Iron         0.106         no         49/49         4/4         0         0           Lead         0.143         no         49/49         4/4         0         0           Magnesium         0.025         Yes         43/49         4/4         0         0           Manganese         0.070         no         44/49         4/4         0         0           Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         2/4         0         0           Selenium         No Site Detects         16/49         0/4         0         0           Sodium	Beryllium	No Site Detec	ts	31/49	0/4	0	0
Chromium         0.125         no         44/49         4/4         0         0           Cobalt         No Site Detects         27/49         0/4         0         0           Copper         0.369         no         39/49         4/4         0         0           Iron         0.106         no         49/49         4/4         0         0           Lead         0.143         no         49/49         4/4         0         0           Magnesium         0.025         Yes         43/49         4/4         0         0           Manganese         0.070         no         44/49         4/4         0         0           Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         2/4         0         0           Selenium         No Site Detects         16/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Vanadium	Cadmium	0.002	Yes	5/49	1/4	1	0
Cobalt         No Site Detects         27/49         0/4         0         0           Copper         0.369         no         39/49         4/4         0         0           Iron         0.106         no         49/49         4/4         0         0           Lead         0.143         no         49/49         4/4         0         0           Magnesium         0.025         Yes         43/49         4/4         0         0           Manganese         0.070         no         44/49         4/4         0         0           Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         2/4         0         0           Selenium         No Site Detects         16/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium	Calcium	0.006	Yes	42/49	4/4	0	0
Copper         0.369         no         39/49         4/4         0         0           Iron         0.106         no         49/49         4/4         0         0           Lead         0.143         no         49/49         4/4         0         0           Magnesium         0.025         Yes         43/49         4/4         0         0           Manganese         0.070         no         44/49         4/4         0         0           Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         2/4         0         0           Selenium         No Site Detects         16/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Chromium	0.125	no	44/49	4/4	0	0
Iron         0.106         no         49/49         4/4         0         0           Lead         0.143         no         49/49         4/4         0         0           Magnesium         0.025         Yes         43/49         4/4         0         0           Manganese         0.070         no         44/49         4/4         0         0           Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         2/4         0         0           Selenium         No Site Detects         16/49         0/4         0         0           Silver         No Site Detects         4/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Cobalt	No Site Detec	ts	27/49	0/4	0	0
Lead         0.143         no         49/49         4/4         0         0           Magnesium         0.025         Yes         43/49         4/4         0         0           Manganese         0.070         no         44/49         4/4         0         0           Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         2/4         0         0           Selenium         No Site Detects         16/49         0/4         0         0           Silver         No Site Detects         4/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Copper	0.369	no	39/49	4/4	0	0
Magnesium         0.025         Yes         43/49         4/4         0         0           Manganese         0.070         no         44/49         4/4         0         0           Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         2/4         0         0           Selenium         No Site Detects         16/49         0/4         0         0           Silver         No Site Detects         4/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Iron	0.106	no	49/49	4/4	0	0
Manganese         0.070         no         44/49         4/4         0         0           Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         2/4         0         0           Selenium         No Site Detects         16/49         0/4         0         0           Silver         No Site Detects         4/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Lead	0.143	no	49/49	4/4	0	0
Mercury         No Site Detects         24/49         0/4         0         0           Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         2/4         0         0           Selenium         No Site Detects         16/49         0/4         0         0           Silver         No Site Detects         4/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Magnesium	0.025	Yes	43/49	4/4	0	0
Nickel         0.308         no         37/49         4/4         0         0           Potassium         0.155         no         41/49         2/4         0         0           Selenium         No Site Detects         16/49         0/4         0         0           Silver         No Site Detects         4/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Manganese	0.070	no	44/49	4/4	0	0
Potassium         0.155         no         41/49         2/4         0         0           Selenium         No Site Detects         16/49         0/4         0         0           Silver         No Site Detects         4/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Mercury	No Site Detec	ts	24/49	0/4	0	0
Selenium         No Site Detects         16/49         0/4         0         0           Silver         No Site Detects         4/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Nickel	0.308	no	37/49	4/4	0	0
Silver         No Site Detects         4/49         0/4         0         0           Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Potassium	0.155	no	41/49	2/4	0	0
Sodium         0.793         no         1/49         1/4         No BTV         No BTV           Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Selenium	No Site Detec	ets	16/49	0/4	0	0
Thallium         No Site Detects         0/49         0/4         No BTV         No BTV           Vanadium         0.115         no         48/49         4/4         0         0	Silver	No Site Detec	ts	4/49	0/4	ŭ	-
Vanadium         0.115         no         48/49         4/4         0         0	Sodium			1/49	1/4	No BTV	
	Thallium	No Site Detec	ts	0/49	0/4	No BTV	No BTV
Zinc 0.115 no 34/49 3/4 0 0	Vanadium	0.115	no	48/49	4/4	0	0
	Zinc	0.115	no	34/49	3/4	0	0

### **Building M119 Comparison to Background**

					1	1
	Probability that the	Is Background	Bkgd	CTO 190	Number of	
	Observed Differences Would		Detection	Detection	Detects >	NDs >
Parameter	Occur Purely by Chance	WRS Test?	Frequency	Frequency	BTV *	BTV *
Aluminum	0.216	no	49/49	4/4	0	0
Antimony	No Site Detec	ts	19/49	0/4	0	0
Arsenic	0.060	no	17/49	2/4	0	0
Barium	0.155	no	46/49	4/4	1	0
Beryllium	No Site Detec	ts	31/49	0/4	0	0
Cadmium	No Site Detec	ts	5/49	0/4	0	0
Calcium	0.011	Yes	42/49	4/4	0	0
Chromium	0.520	no	44/49	4/4	0	0
Cobalt	0.467	no	27/49	1/4	0	0
Copper	0.513	no	39/49	4/4	0	0
Iron	0.241	no	49/49	4/4	0	0
Lead	0.743	no	49/49	4/4	0	0
Magnesium	0.247	no	43/49	4/4	0	0
Manganese	0.221	no	44/49	4/4	0	0
Mercury	No Site Detec	ts	24/49	0/4	0	0
Nickel	0.129	no	37/49	4/4	0	0
Potassium	0.698	no	41/49	1/4	0	0
Selenium	No Site Detec	ts	16/49	0/4	0	0
Silver	No Site Detec	ts	4/49	0/4	0	0
Sodium	No Site Detec	ts	1/49	0/4	No BTV	No BTV
Thallium	No Site Detec	ts	0/49	0/4	No BTV	No BTV
Vanadium	0.394	no	48/49	4/4	0	0
Zinc	0.573	no	34/49	1/4	0	0

### **Building M315 Comparison to Background**

	Probability that the	Is Background	Bkgd	CTO 190	Number of	Number of
	Observed Differences Would	Exceeded via	Detection	Detection	Detects >	NDs >
Parameter	Occur Purely by Chance	WRS Test?	Frequency	Frequency	BTV *	BTV *
Aluminum	0.172	no	49/49	5/5	0	0
Antimony	No Site Detec	ts	19/49	0/5	0	0
Arsenic	0.062	no	17/49	1/5	1	0
Barium	0.137	no	46/49	5/5	0	0
Beryllium	No Site Detec	ts	31/49	0/5	0	0
Cadmium	No Site Detec	ts	5/49	0/5	0	0
Calcium	0.009	Yes	42/49	5/5	0	0
Chromium	0.248	no	44/49	5/5	0	0
Cobalt	0.333	no	27/49	2/5	0	0
Copper	0.172	no	39/49	5/5	0	0
Iron	0.257	no	49/49	5/5	0	0
Lead	0.037	Yes	49/49	5/5	1	0
Magnesium	0.248	no	43/49	5/5	0	0
Manganese	0.333	no	44/49	5/5	0	0
Mercury	No Site Detec	ts	24/49	0/5	0	0
Nickel	0.058	no	37/49	5/5	0	0
Potassium	0.547	no	41/49	2/5	0	0
Selenium	No Site Detec	ts	16/49	0/5	0	0
Silver	No Site Detec	ts	4/49	0/5	0	0
Sodium	No Site Detec	ts	1/49	0/5	No BTV	No BTV
Thallium	No Site Detec	ts	0/49	0/5	No BTV	No BTV
Vanadium	0.216	no	48/49	5/5	0	0
Zinc	0.154	no	34/49	3/5	0	0

Figure 1: Scatter Plots for Building SAS113 Surface Soil Metals

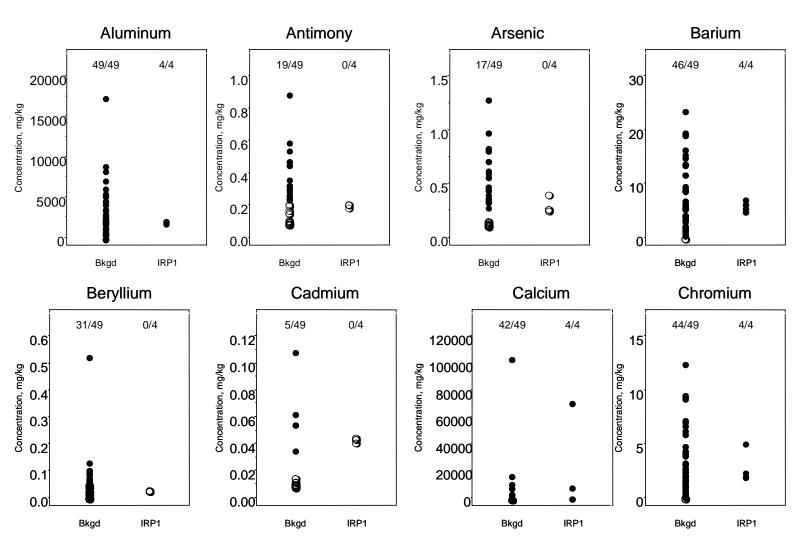


Figure 1: Scatter Plots for Building SAS113 Surface Soil Metals

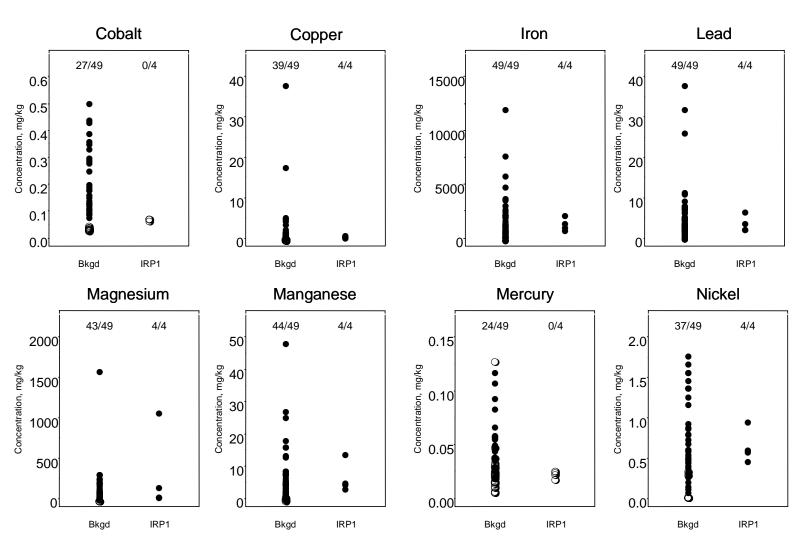


Figure 1: Scatter Plots for Building SAS113 Surface Soil Metals

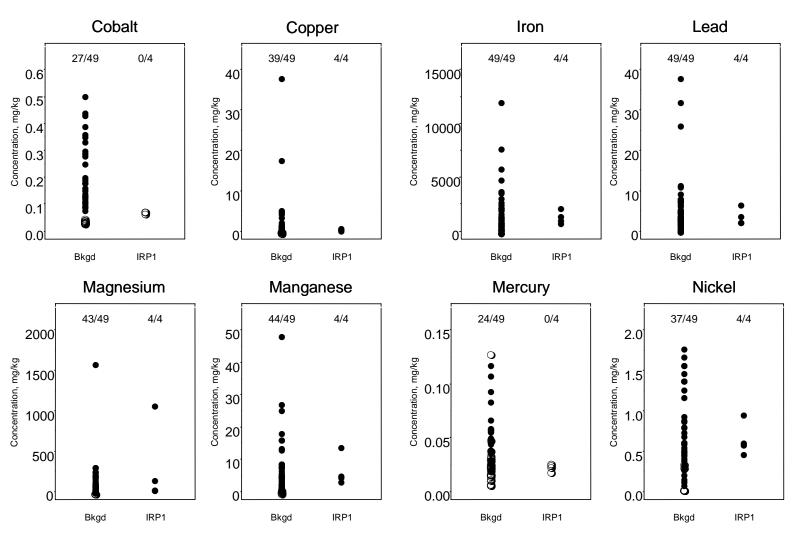


Figure 2: Scatter Plots for Building AS116 Surface Soil Metals

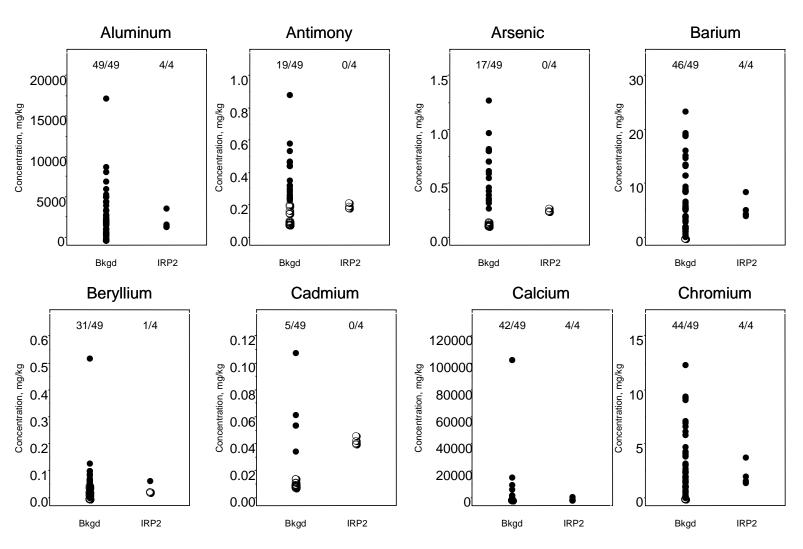


Figure 2: Scatter Plots for Building AS116 Surface Soil Metals

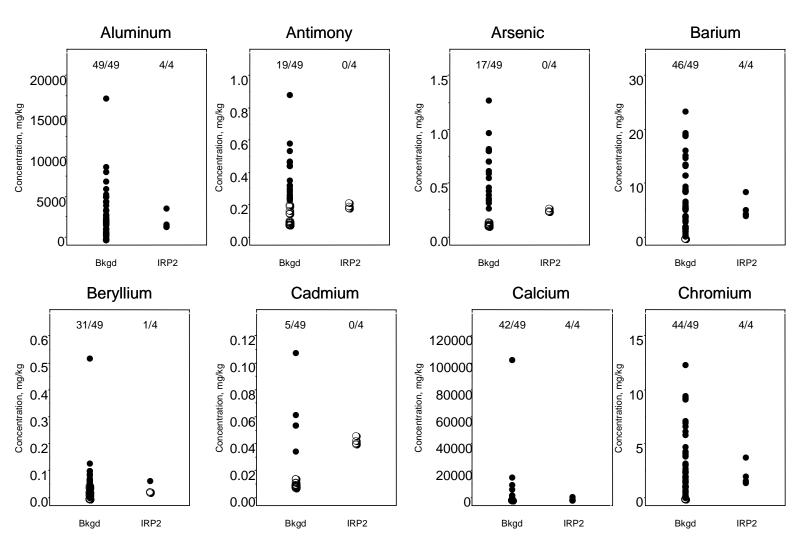


Figure 2: Scatter Plots for Building AS116 Surface Soil Metals

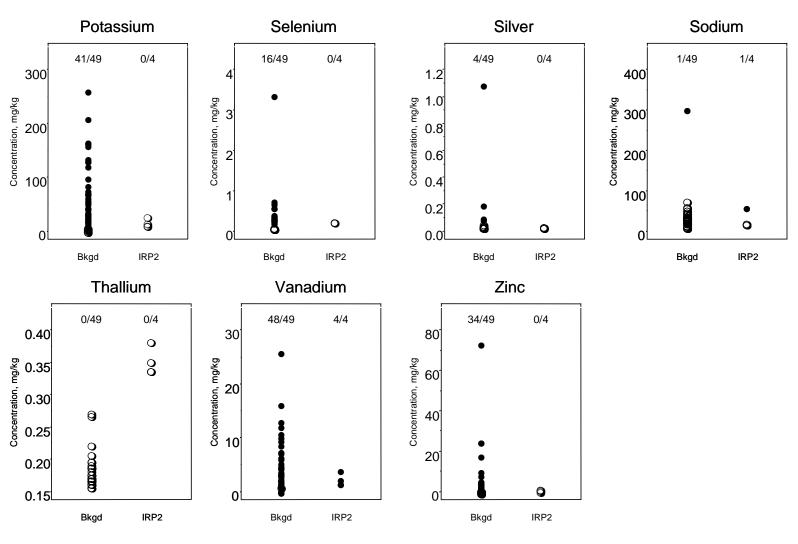


Figure 3: Scatter Plots for Building AS119 Surface Soil Metals

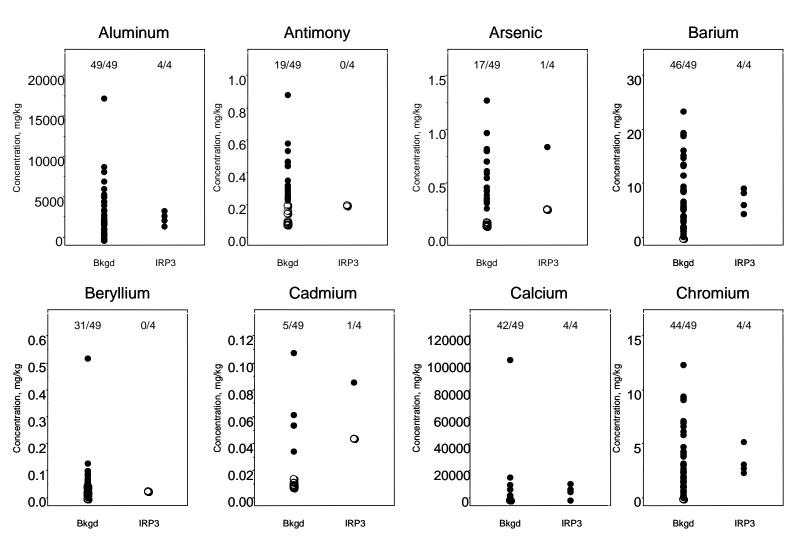


Figure 3: Scatter Plots for Building AS119 Surface Soil Metals

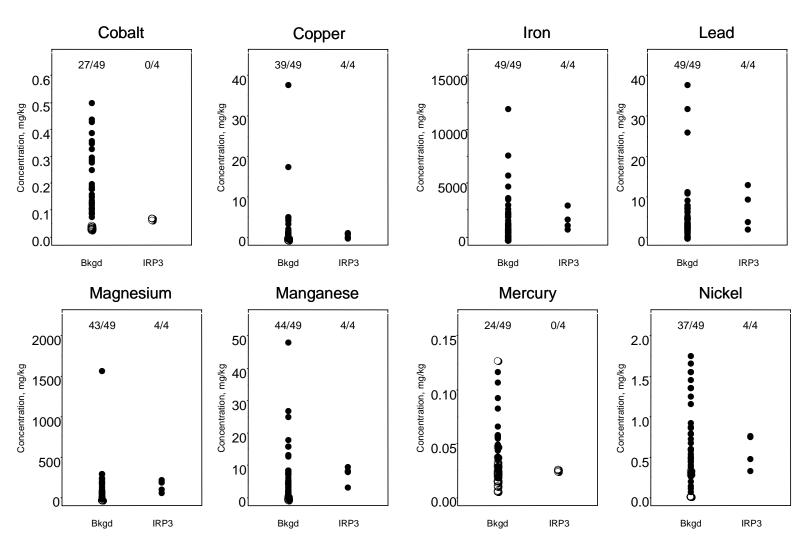


Figure 3: Scatter Plots for Building AS119 Surface Soil Metals

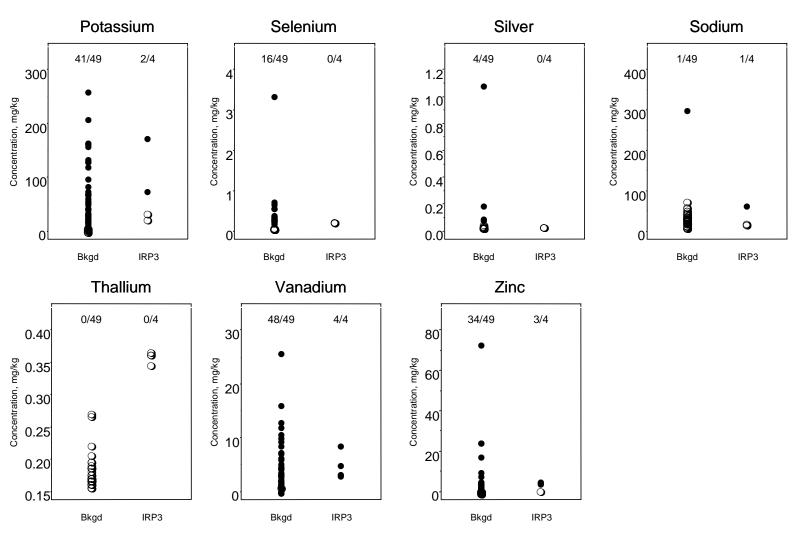


Figure 4: Scatter Plots for Building M119 Surface Soil Metals

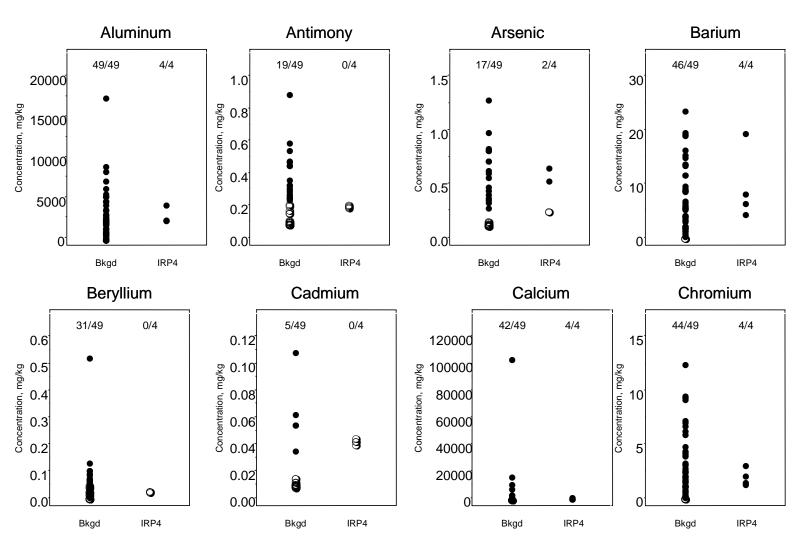


Figure 4: Scatter Plots for Building M119 Surface Soil Metals

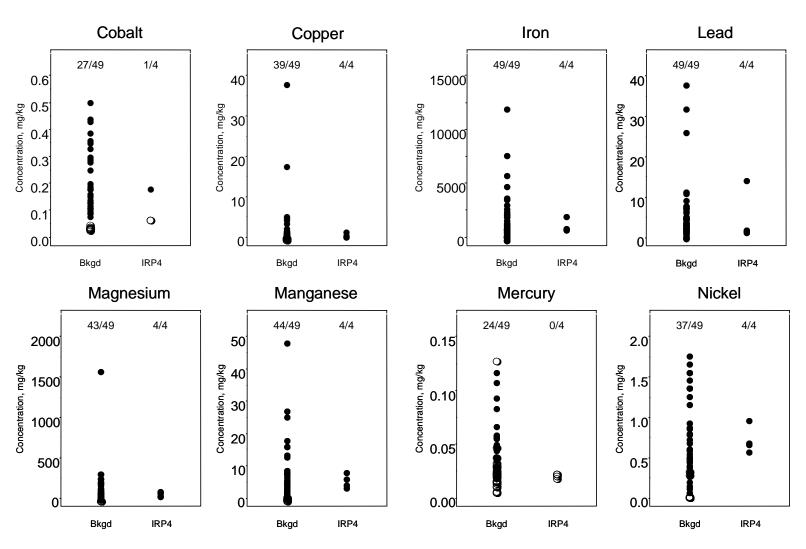


Figure 4: Scatter Plots for Building M119 Surface Soil Metals

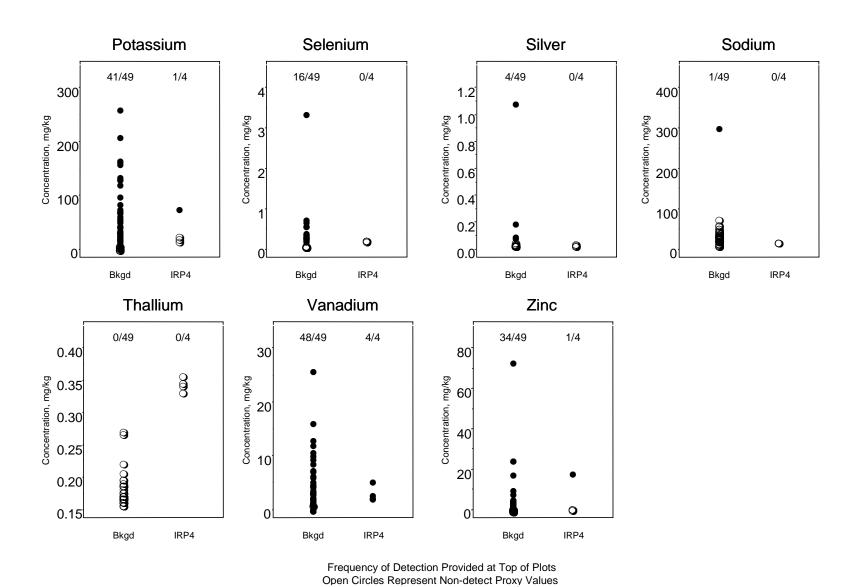


Figure 5: Scatter Plots for Building M315 Surface Soil Metals

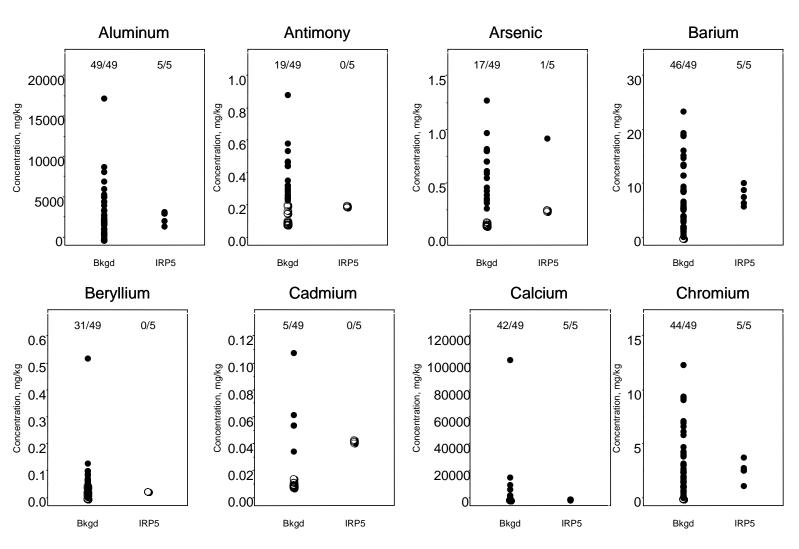


Figure 5: Scatter Plots for Building M315 Surface Soil Metals

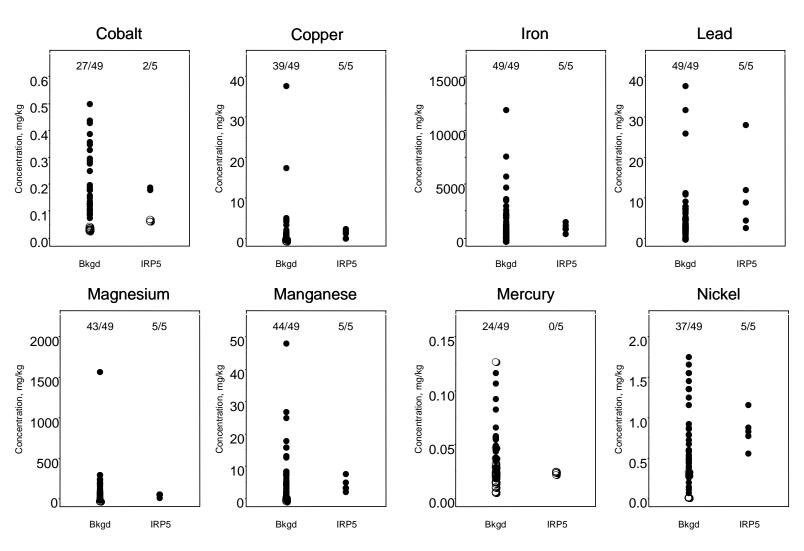


Figure 5: Scatter Plots for Building M315 Surface Soil Metals

